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# Exploring Leadership Styles and Their Impact on Innovation in TVET: Insights from a Systematic Analysis

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**ABSTRACT**

**Objective:** This study examines the influence of leadership styles on promoting innovation in the Technical and Vocational Education and Training (TVET) sector. The study addresses a notable research gap by identifying the leadership strategies that are most effective in fostering innovation within the swiftly changing educational and industrial environments. **Method:** The study used a Systematic Literature Review (SLR) technique organized by PRISMA criteria. Articles from peer-reviewed journals in the Scopus and ERIC databases, published between 2021 and 2024, were examined. A thorough search technique included specified keywords and Boolean operators, resulting in 659 articles, of which 36 were chosen following rigorous screening according to inclusion and exclusion criteria. **Results:** The analysis highlights transformational, inclusive, and innovative leadership styles as pivotal in fostering creativity, technological integration, and collaborative practices in the TVET area. Transformational leadership emerged as the most effective, emphasizing vision alignment and team empowerment. Inclusive and innovative leadership also demonstrated strong potential in enhancing institutional responsiveness to industry needs. **Novelty:** This study provides a comprehensive synthesis of the impact of leadership styles on innovation within TVET, addressing a critical gap in existing literature. It offers actionable insights for policymakers and practitioners to adopt leadership strategies that align educational outcomes with industry demands, ensuring institutional competitiveness and relevance.

## INTRODUCTION

Leadership within an organization is a key element that directly influences its success and effectiveness, including in Technical and Vocational Education and Training (TVET) institutions. Leaders play an essential role in shaping the values, culture, and motivation of all members within the organization, which directly impacts the level of innovation and overall organizational success (Hassan & Sanusi, 2015; Osman & Kamis, 2019). Leadership success is not solely determined by planning strategies but also by the leader's ability to encourage individuals to generate innovative ideas and enhance the organization's overall performance. Effective leaders can create an innovative culture that supports institutional development, as demonstrated in various TVET institutions, where innovative leadership successfully improves organizational performance by developing team members' innovative thinking (Gachunga et al., 2020; Ismail & Yasin, 2020). In the TVET context, a leadership approach that emphasizes innovation is critical. Research shows that transformational leadership attributes, such as the ability to inspire a shared vision and facilitate innovation, have a significantly positive effect on fostering a sustainable, innovation-driven organizational culture (Abdullah et al., 2021).

TVET institutions face significant challenges in preparing a skilled workforce amid evolving technologies and ever-changing labor market demands. Implementing innovative leadership styles is a key factor in meeting these challenges. Innovative leadership plays a vital role in creating work environments that promote creativity, collaboration, and the adoption of new technologies, ensuring that institutions remain relevant and competitive in an era of rapid change (Hassan & Sanusi, 2015; Osman & Kamis, 2019). Conversely, non-adaptive leadership styles may hinder an institution's ability to innovate, whether in curriculum development, teaching methods, or human resource management (Barnes & Gearin, 2022; Hordieiev et al., 2023; Jiang et al., 2023; Panto et al., 2024; Wijaya, 2024). Studies indicate that transformational leadership—characterized by a clear vision, inspiration, and empowerment—is a highly effective approach to addressing these challenges in TVET institutions (Ismail & Yasin, 2020; Mesfin & Niekerk, 2019).

Currently, TVET institutions employ various leadership styles selected based on organizational needs and the leader's characteristics. Certain leadership styles, such as transformational leadership, have been shown to influence the extent to which innovation is implemented, including developing new training programs, using digital technologies, and collaborating with industry (Osman & Kamis, 2019). Other research suggests that organizational culture and learning are key mediators in the relationship between leadership style and innovation (Cui et al., 2022; Khan et al., 2020). Although previous studies have explored the relationship between leadership style and organizational innovation in general contexts (Alblooshi et al., 2020), research specifically examining the impact of leadership style on innovative outcomes within TEVT institutions remains very limited. This gap highlights the need for an in-depth investigation to understand how leadership styles influence innovation in the TVET sector, given its strategic role in bridging the needs of the workforce and the education system.

There is ample opportunity for further exploration into the impact of leadership styles on innovation in the TVET sector, particularly given the rapidly evolving demands of industry and technology in 2024. This study stands out by conducting a systematic literature review (SLR) to synthesize the most recent findings, including how leadership influences organizational culture and employee performance and the role of leadership in enhancing institutional performance (Abiddin, 2024; Samodien et al., 2024). While distributed leadership practices in vocational education highlight the challenges in integrating active learning methodologies like Project-Based Learning (PBL) (Figueroa et al., 2023), other works reinforce the significance of leadership in Education 4.0 (Suyudi et al., 2020). However, the lack of systematic studies addressing the specific effects of leadership styles on TVET innovation, especially in 2024, underscores this study's contribution to bridging this gap.

This study offers insights into how leadership strategies influence collaboration, creativity, and technological integration in TVET institutions. Specifically, it investigates:

1. How do different leadership styles influence innovation outcomes in TVET institutions?
2. What opportunities and challenges arise in implementing these leadership styles to foster sustainable innovation in TVET institutions?

This study provides a comprehensive analysis, leveraging global perspectives, to propose forward-looking recommendations for innovation-driven leadership policies

and strategies in TVET institutions, ensuring alignment with workforce needs and sustainable institutional practices.

## RESEARCH METHOD

This study employs an SLR approach based on the PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (Carlo Torres et al., 2024; Page et al., 2021; Wilson et al., 2024). The primary objective of this review is to identify the impact of leadership styles on innovation within the context of TVET. This approach consolidates relevant literature while ensuring transparency, systematic rigor, and replicability in evaluating prior studies. The research focused on peer-reviewed journal articles available in full text through the Scopus and ERIC databases.

### *Identification Process*

The literature search was conducted using two primary databases: Scopus and ERIC. The search strategy involved using specific keywords combined with Boolean operators to ensure comprehensive coverage of relevant literature. The keywords used in Scopus were: ("leader*" AND "style*" OR "approach*" OR "method*" OR "strategi*" AND "style*" OR "approach*" OR "method*" OR "strategy*" AND "impact*" OR "effect" OR "influence*" OR "outcome*" AND "TVET" OR "technical and vocational education and training" OR "technical education" OR "vocational education" OR "vocational training" OR "technical training" OR "vocational" OR "CTE" OR "career technical education"). The asterisk (*) symbol in databases like Scopus was used as a wildcard to capture various word forms with the same root or prefix, allowing broader search results and including relevant keyword variations. Meanwhile, the keywords for ERIC were: ("leadership styles" effect on "innovation" in "vocational education"). The search was restricted to articles published since 2021, written in English, available in full text, and classified as journal articles. The search yielded 659 articles: 317 from Scopus and 342 from ERIC.

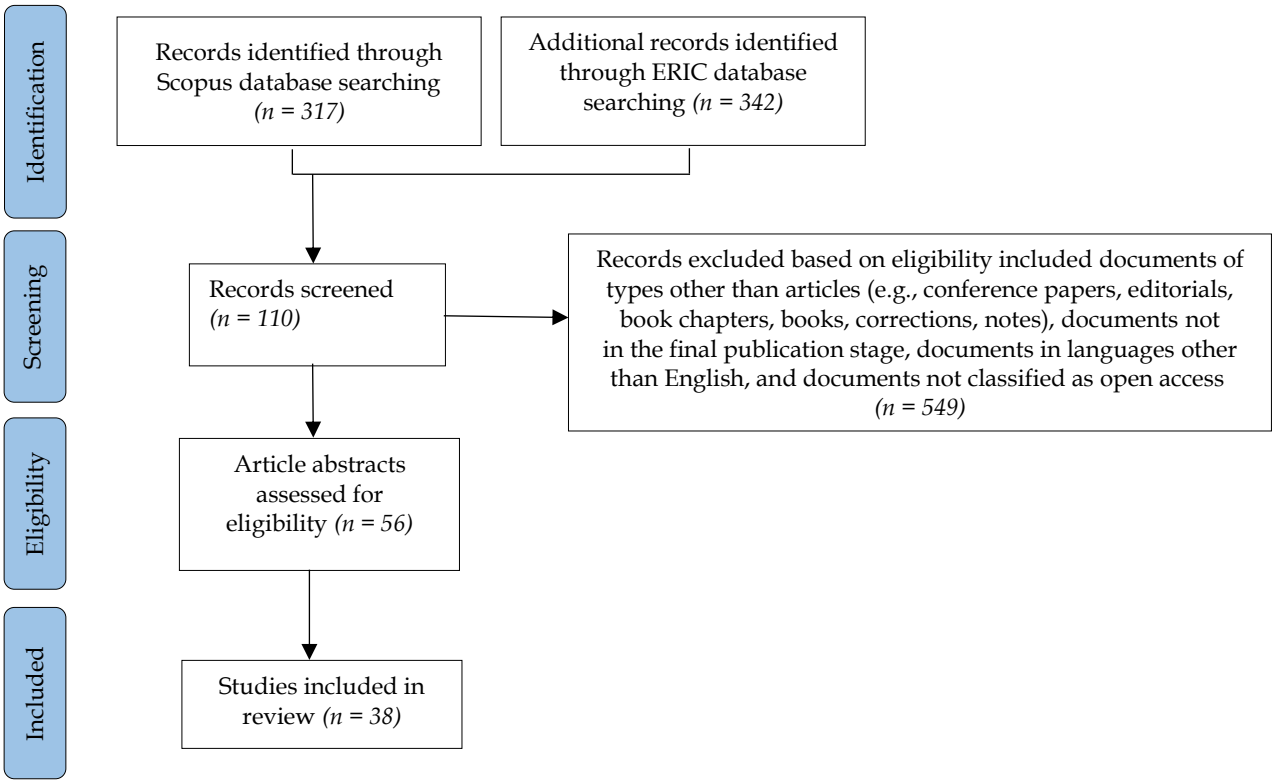

**Figure 1.** PRISMA flow diagram of the present study.

***Screening Process***

After the identification stage, 110 articles were selected for further screening based on inclusion and exclusion criteria. The inclusion criteria encompassed peer-reviewed articles discussing the relationship between leadership styles and innovation in the vocational education context. Articles not in English, not journal articles (e.g., books, opinion pieces, book chapters), or lacking full-text availability were excluded. After the initial screening, 56 articles proceeded to the eligibility assessment stage.

***Eligibility Process***

At this stage, the abstracts of the 56 articles were further evaluated to determine their relevance to the study's focus. Articles not explicitly addressing the relationship between leadership styles and innovation in vocational education were excluded. As a result, 36 articles were selected for in-depth analysis.

***Data Synthesis Process***

Data from the 36 eligible articles were collected and analyzed. Key information, including the types of leadership styles, innovation outcomes, and TVET contexts, were systematically extracted and organized into tables to facilitate synthesis. The synthesis focused on identifying the main themes and their impact on innovation in TVET institutions. From this analysis, five main themes and 18 subthemes emerged, providing comprehensive insights into how leadership styles influence innovation in the vocational education sector.

***The outcome of the Process***

The PRISMA flow diagram (see Figure 1) summarizes the steps of identification, screening, and eligibility assessment, culminating in the final selection of 36 articles for this systematic review.

## RESULTS AND DISCUSSION

### *Results*

This study aims to evaluate the influence of leadership styles on innovation within TVET. The research focuses on understanding how leadership strategies impact innovation outcomes, particularly fostering collaboration, adaptability, and creativity in TVET institutions. Specifically, the study investigates two critical questions: How do different leadership styles influence innovation outcomes in TVET institutions? What opportunities and challenges arise in implementing these leadership styles to foster sustainable innovation in TVET institutions? Based on the analysis, the following are the main findings concerning the number of studies published per year, the leadership styles examined in the TVET context, and the methodologies employed in the dataset.

Studies discussing leadership styles and their relation to innovation in TVET show a significant increase between 2021 and 2024. 2021 only two studies were published, rising to four in 2022. The year 2023 marked a peak with 15 studies, and this trend continued into 2024 with the same number. This surge reflects a growing interest in leadership and innovation in vocational education, particularly in changing industry and technological demands.

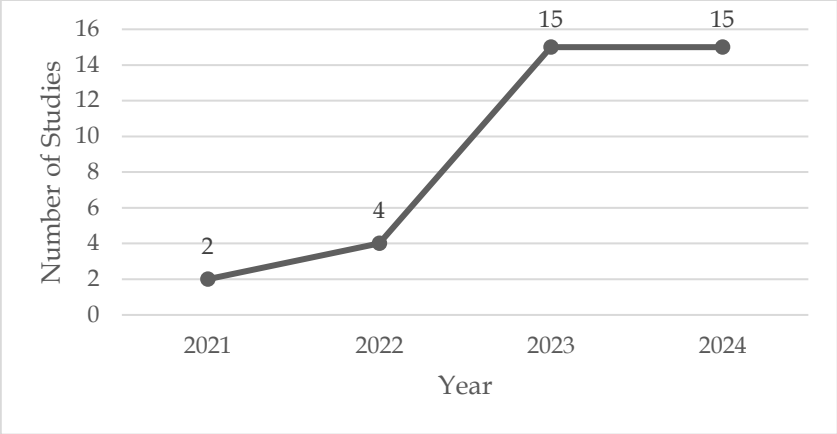


**Figure 2.** Number of studies over the years.

Various leadership styles have been examined in the TVET context to assess their impact on innovation. Transformational leadership is the most frequently studied, with five investigations highlighting how leaders inspire and mobilize change toward innovation (Jafarov, 2024; Mohd et al., 2023; Michel et al., 2023; Pratama et al., 2024; Torres-Mancera et al., 2023). Transglobal (Fiernaningsih et al., 2022, 2023; Herijanto et al., 2023) and inclusive (Burt et al., 2023; Derk et al., 2023; Tang et al., 2023) each appeared in three studies, indicating the importance of collaboration and stakeholder engagement in driving innovation. Innovation-focused (Chanprasert et al., 2023; Sutiyatno et al., 2022), distributed, managerial, and mentoring leadership styles appeared in two studies, underscoring the relevance of specific approaches to fostering innovation in TVET institutions. Other leadership styles, such as adaptive, authentic, community-based, responsive, or emotionally intelligent leadership, were each discussed in only one study. Although these latter styles have not been central research focuses, they still offer significant potential for application within vocational education. This pattern reflects the diversity of research interests and various leadership strategies that support innovation.

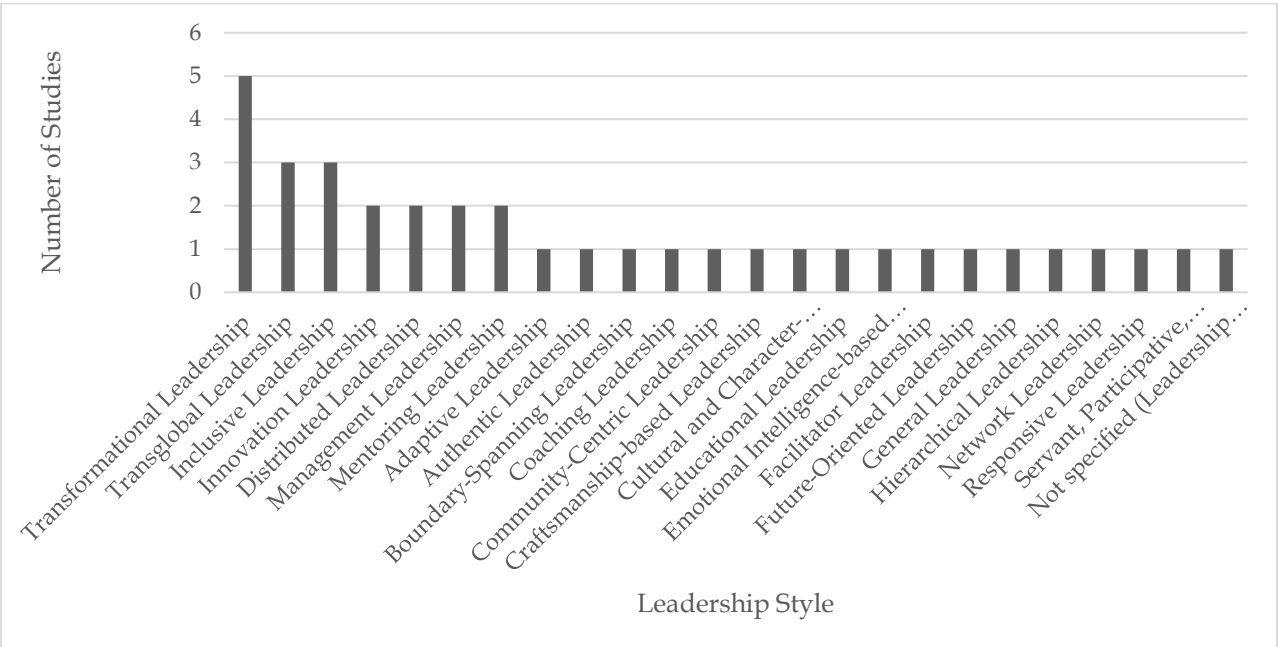


**Figure 3.** Frequency of leadership styles studied.

The analyzed studies employed a variety of methodologies to assess the relationship between leadership style and innovation in TVET. Quantitative approaches used in 19 studies were dominant, reflecting a preference for empirical data and statistical analysis. Mixed-method approaches were employed in eight studies, combining the strengths of quantitative and qualitative methods to provide more comprehensive insights. Qualitative approaches, used in seven studies, offered an in-depth contextual understanding of individual experiences and organizational dynamics. Although R&D (Research and Development) approaches were used in only two studies, they focus on developing applicable models or frameworks within the TVET context. This methodological diversity underscores the importance of multiple approaches to fully comprehend the complexity of the relationship between leadership styles and innovation.

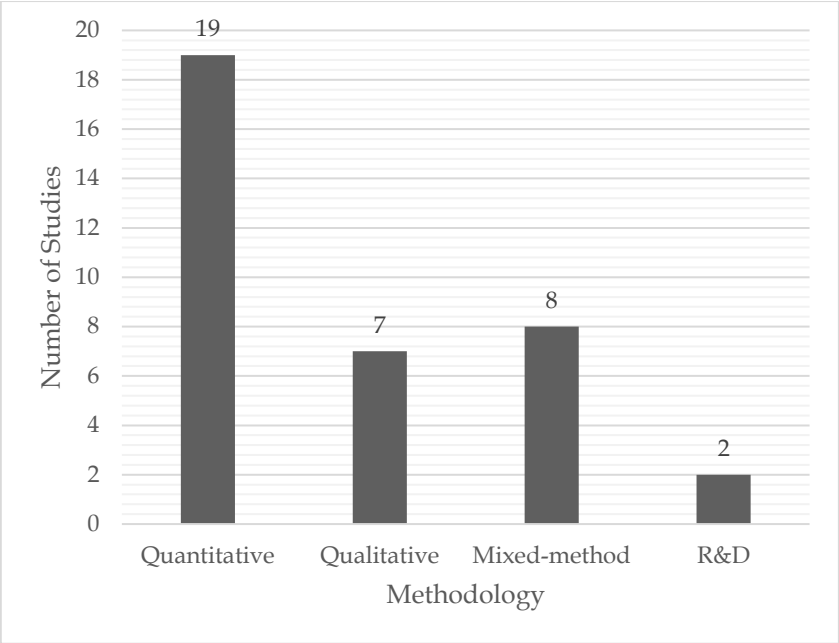


**Figure 4.** Distribution of methodologies in studies.

The analysis shows that research on leadership in the TVET context spans various institutions and training environments. Corporate/Professional Training contexts were the most frequently studied, with 13 studies emphasizing leadership's role in industry-oriented training sectors. This focus highlights the significance of leadership in fostering innovation within professional environments. Higher education followed closely with 11 studies, reflecting a strong interest in leadership's influence within academic institutions focused on developing advanced skills and knowledge. Similarly, 10 studies centered on Vocational Schools, underscoring their critical role in equipping learners with practical, workforce-relevant skills. This focus suggests that leadership-driven strategies are pivotal in aligning vocational training with market needs. Meanwhile, only two studies addressed the General TVET context, indicating that broader, cross-institutional perspectives remain underexplored. These findings point to an opportunity for further research to examine leadership's role across a more diverse range of vocational education and training settings.

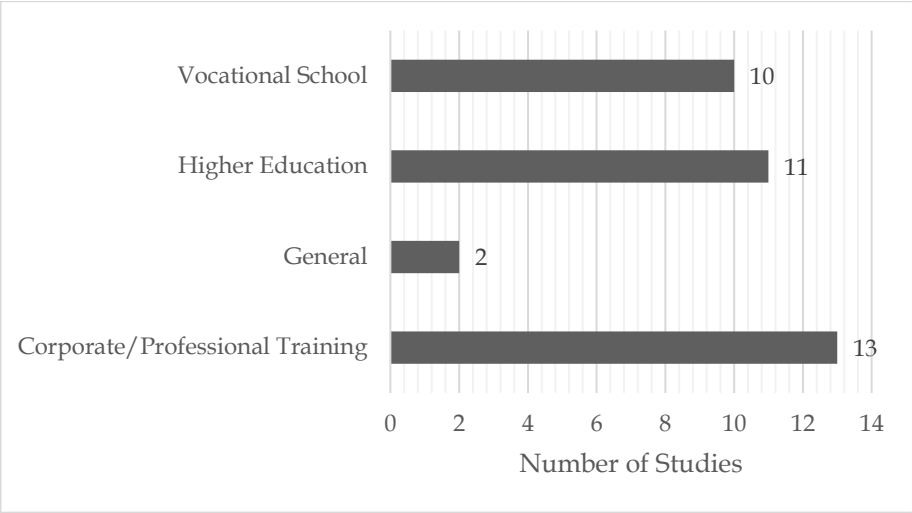


**Figure 5.** TVET context used in studies.

**Table 1.** Data and context synthesis of the studies.

| Authors | TVET Context | Leadership Style | Methodology | Innovation Outcomes |
|---|---|---|---|---|
| (Lackéus, 2024) | Focuses on bridging the divide between education and working life | Not specified (Leadership strategy) | Qualitative: Action research and inductive articulation | Servant, participative, and democratic leadership positively impact vocational graduate competitiveness, moderated by graduate competence. |
| (Prummer, Human-Vogel, & Pittich, 2024) | South African VET; professional leadership development for VET leaders | Mentoring Leadership | Qualitative: Interactive qualitative analysis (IQA); focus groups and interviews | Demonstrated a significant effect of distributed leadership on student learning outcomes. Capacity building was the strongest predictor. |
| (Siswanto et al., 2024) | Teachers and principals in vocational schools | General Leadership | Quantitative survey; Partial Least Squares (PLS) | Leadership and organizational culture positively influence lecturer motivation; organizational culture has moderate effects. |
| (Prummer, Human-Vogel, Graham, et al., 2024) | South African VET sector; mentoring to develop leaders' emotional intelligence | Mentoring Leadership | Quantitative study; Exploratory and confirmatory factor analysis, mediation analysis | The emotional intelligence of principals and a positive psychological climate enhance teacher motivation. |
| (Sutiyatno et al., 2022) | Vocational schools in Indonesia; innovation leadership in VET | Innovation Leadership | Quantitative survey; Structural Equation Modeling (SEM) | Increased intermediate-advanced competencies (41%-57%) among participants; improved program outcomes and efficiency. |
| (M Mohd Siraj et al., 2023) | TVET teachers in Malaysia integrating ICT | Transformatio nal and instructional | Quantitative: Correlational study, survey, regression, and Pearson correlation analysis | Developed frameworks for universities as innovation hubs, emphasizing entrepreneurship and global engagement |
| (Herijanto et al., 2023) | Vocational lecturers in Indonesia focusing on work environments | Transglobal Leadership | A quantitative survey using SmartPLS | Hands-on, immersive training in clinical research and measurable professional development for underrepresented groups. |
| (Y. Tang et al., 2023) | Vocational colleges in China | Inclusive Leadership | Quantitative study using SEM; surveys | Developed explicit and implicit competencies framework (e.g., resource integration, innovation, and leadership). |
| (Papanai & Poolkrajang, 2023) | High Vocational Innovation Scholarship Program in Thailand | Management Leadership | Quantitative study: CIPPIEST Model evaluation; surveys | Highlighted female leadership values (e.g., sustainability and innovation) and identified startup gender startups |
| ang, 2021) | Focuses on sustainable workplace in educational institutions | Authentic Leadership | Quantitative: Two-wave quantitative survey; moderated mediation analysis | A mentoring framework: Individual, peer group, and expert-based mentoring improves leadership and emotions |
| (Park et al., 2023) | Focus on organizational strategies in medical device companies, including education and training. | Hierarchical Leadership | Quantitative analysis using survey data; human capital panel surveys (Korea). | Integrating indigenous values promotes localized, equitable, and sustainable TVET systems aligned with SDGs. |
| (Burt et al., 2023) | Graduate-level training to foster leadership and social responsibility in atmospheric science fields. | Inclusive Leadership | Mixed-method approach: surveys, interviews, and course evaluations in a pilot graduate course. | Sustainable innovation is achieved through collective leadership and learning structures. |
| (Fiernaningsih et al., 2023) | Focus on innovative behavior of vocational lecturers in Indonesia to improve employee performance. | Transglobal Leadership | Quantitative analysis using SmartPLS 3.0, proportional random sampling of 316 vocational lecturers. | Highlights soft skills like communication, critical thinking, and leadership as essential for the private sector. |

| Authors | TVET Context | Leadership Style | Methodology | Innovation Outcomes |
|---|---|---|---|---|
| (Pratama et al., 2024) | Government vocational higher education (GVHE) in Indonesia; the relationship between organizational culture, leadership, and motivation. | Transformational Leadership | Quantitative study: Explanatory research using PLS (Partial Least Squares) with questionnaire surveys. | Enhanced cross-border healthcare education and training through network-building and market-driven collaborations |
| (Matu & Rothwell, 2024) | Aligning TVET with local needs using the "Harambee" philosophy and transitioning from Voluntary National Reviews (VNRs) to Voluntary Local Reviews (VLRs). | Community-Centric Leadership | Qualitative: Comparative case study of TVET governance models in Kenya and USA; integration of indigenous philosophies. | Innovation leadership positively influences teacher commitment through organizational culture |
| (Wei et al., 2024) | Competency development model for professional group leaders (PGL) in higher vocational colleges in Fujian, China. | Management Leadership | Mixed methods: Structural Equation Modeling (SEM) using AMOS and qualitative coding with NVivo. | A model for adaptive leadership, consisting of principles, objectives, content, methods, and evaluation, was developed. The results showed significant improvement in leadership behavior. |
| (Fix et al., 2021) | Vocational Education and Training (VET) schools in the Netherlands focusing on curriculum innovation. | Distributed Leadership | Qualitative research with case studies and teacher interviews using IMSI and SDT frameworks. | Organizational inclusion, leadership, and job satisfaction improve teachers' intrinsic motivation |
| (Liang, 2024) | Higher vocational teachers in China are evaluating their craftsmanship under Internet-based education. | Craftsmanship-based Leadership | Quantitative study: Descriptive statistics, cluster analysis using FCM and Gaussian models, and survey practices. | Principals' leadership styles (transformational and instructional) significantly influence teachers' motivation. |
| (Aminu et al., n.d.) | Capacity-building for leadership in Nigeria's health institutions. | Responsive Leadership | Mixed-method: Responsive Feedback (RF) mechanism, pre-post evaluation, and Kirkpatrick model. | Leadership assessment, technology revolution, and personal development influence empowered people and future leadership readiness. |
| (Fiernaningsih et al., 2022) | Vocational higher education in Indonesia. | Transglobal Leadership | Quantitative: Survey using SEM-PLS on 316 vocational lecturers. | Integration of leadership, school culture, and dormitory life for character development in students. |
| (Nyamweru et al., 2024) | Vocational agricultural education in Burundi. | Facilitator Leadership | Mixed-Methods: Delphi technique with experts (28 teachers and practitioners) over multiple rounds. | Students became "diversity champions" and developed actionable DEIAJ initiatives. |
| (Torres-Mancera et al., 2023) | Entrepreneurship and leadership in Spain and Portugal. | Transformational Leadership | Qualitative: Triangulation with in-depth interviews, content analysis, and literature review. | Demonstrates coaching leadership enhances employee engagement via organizational self-esteem and learning goal orientation. |
| (Seanchan et al., 2024) | Focus on adaptive leadership for division heads in technical colleges under the Office of Vocational Education Commission, Thailand. | Adaptive Leadership | R&D (Research and Development) is conducted in four phases. | Proposes "work-learn balance" as a new concept to balance learning and value creation |
| (Ghirmai, 2024) | Principals' distributed leadership practices in TVET schools in Eritrea. | Distributed Leadership | Quantitative study using Structural Equation Modeling (SEM). | Stakeholder feedback drives curriculum improvement and sustainability evaluation |
| (Wu, 2023) | Comparison of high schools and vocational high schools in Taiwan. | Emotional Intelligence-based Leadership | Quantitative study using MANOVA and hierarchical multiple regression. | Differentiation strategy and innovative culture improved organizational performance. |
| (Chanprasert et al., 2023) | Private vocational college administrators in Northeastern Thailand. | Innovative Leadership | Mixed-methods research, four phases, with a focus on model development. | Identify 11 key competencies for fostering sustainable agriculture, including "facilitator of change." |

| Authors | TVET Context | Leadership Style | Methodology | Innovation Outcomes |
|---|---|---|---|---|
| (Nurlaili, 2023) | Vocational schools in Samarinda, Indonesia. | Servant, Participative, Democratic Leadership | Quantitative survey with SEM. | Innovation leadership directly and indirectly influences teacher commitment through organizational culture. |
| (Widodo et al., 2022) | Future vocational leadership capacity in Indonesian vocational education. | Future-Oriented Leadership | Quantitative study using SEM. | Transglobal leadership and organizational support significantly influence proactive attitudes and innovative work behavior. |
| (Jafarov, 2024) | Strategic educational policy of 'University 3.0' to enhance lifelong learning and innovation ecosystems | Transformational Leadership | Qualitative: Literature review, policy analysis, and contextual analysis of 3rd Generation Universities | Creating a novel online geriatrics and gerontology training program (flipped learning and ECHO methods). |
| (Ofstad & Bartel-Radic, 2024) | Corporate training within German high-tech multinational for vocational trainers | Boundary-Spanning Leadership | Qualitative: Ethnographic action research, 21 semi-structured interviews, grounded theory | Leadership, psychological security, and self-efficacy enhance knowledge management and innovation capability |
| (Salter et al., 2022) | Healthcare education and professional development in international markets, focusing on China-England exchanges | Network Leadership | Mixed methods: Comparative policy analysis, market evaluation, and case study of China-England healthcare engagement | Development of guidelines for innovative leadership, including components like vision creation and risk-taking. |
| (L. Tang et al., 2024) | Vocational context of employee engagement within business organizations. | Coaching Leadership | A quantitative study using survey data (402 MBA/EMBA students) to examine the effects of coaching leadership. | Peer group mentoring effectively enhances emotional intelligence, empathy, and resilience |
| (Michel et al., 2023) | Focus on healthcare professionals caring for older adults. | Transformational Educational Leadership | R&D: Development of the IAGG e-TRIGGER online training program for healthcare professionals; qualitative insights from previous training experiences. | Introduced boundary-spanning practices, fostering cooperative learning among trainers and innovative upskilling models |
| (Derk et al., 2023) | Internship model for clinical research training aimed at diverse leaders. | Inclusive Leadership | Mixed Methods: A cross-institutional capstone internship program for clinical research, with pre-and post-program surveys, workshops, and mentor support. | Proposed strategies for teacher development through craftsmanship and innovation. |
| (Al-Saadi et al., 2024) | Identifies soft skills needed for employability among fresh graduates in Oman. | Educational Leadership | A quantitative survey of 101 fresh graduates in Oman to assess skill gaps in business administration. | Authentic leadership positively affects change-oriented behavior, moderated by employees' sense of "calling." |
| (Limbong et al., 2023) | Focus on vocational high school students in Indonesia. | Cultural and Character-Building Leadership | Mixed-method sequential explanatory design (quantitative surveys followed by qualitative interviews). | Work environment and organizational culture influence creative self-efficacy and innovative work behavior |

***Discussion***

Based on the analysis, the findings highlight the growing interest in leadership styles and their relation to innovation in TVET, as evidenced by the increasing number of studies published from 2021 to 2024. This rise underscores the importance of leadership strategies in navigating rapidly evolving industry demands. The aspect of innovation in Technical and Vocational Education and Training (TVET) institutions is strongly influenced by the leadership style employed. Transformational, transglobal, inclusive, innovative, distributed, managerial, and mentoring leadership styles have been the focus of various studies, demonstrating a direct correlation between leadership approaches and the level of innovation within these institutions. In addition to significantly impacting an institution's ability to adapt to industry and technological needs, these leadership styles influence how leaders mobilize teams to achieve sustainable innovation goals.

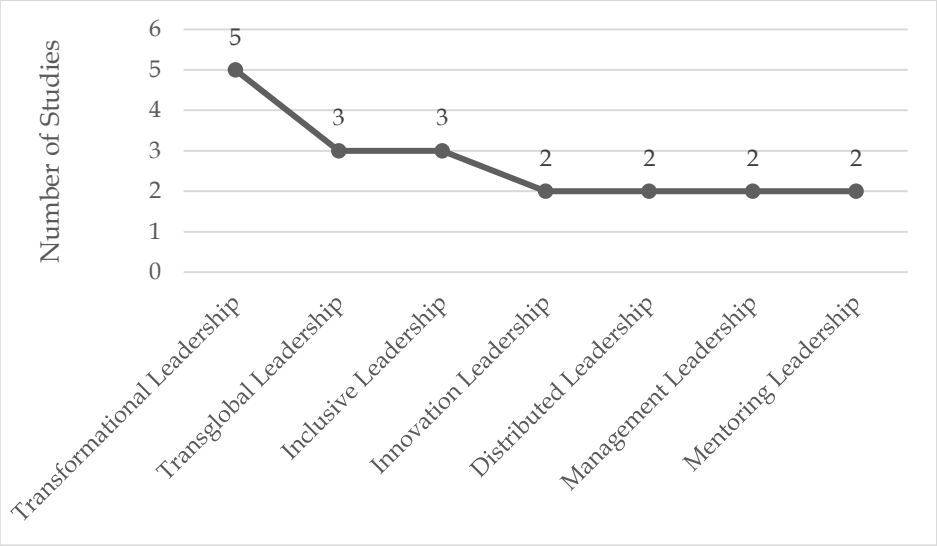


**Figure 6.** Most leadership styles are used in studies.

The aspect of innovation in TVET institutions is strongly influenced by the leadership style employed. Various studies have focused on transformational, transglobal, inclusive, innovative, distributed, managerial, and mentoring leadership styles, each demonstrating a direct correlation between leadership approaches and the level of innovation within these institutions. In addition to significantly impacting an institution's ability to adapt to industry and technological needs, these leadership styles influence how leaders mobilize teams to achieve sustainable innovation goals.

**Leadership Styles and Innovation in TVET**

The discussion expands on the mechanisms, contributions, and limitations of this study's most used leadership styles. Leadership style refers to a leader's approach to encouraging innovative behavior within teams or organizations (Fries et al., 2021). Various studies have indicated that different leadership approaches influence the degree of innovation institutions achieve (Fischer & Sitkin, 2023; Jamali et al., 2022; Khan et al., 2020). Comparative studies involving TVET institutions from multiple countries suggest that certain leadership styles, such as transformational and distributed, significantly enhance the institution’s capacity to innovate, both in curriculum development and in industry collaboration. This study examines the relationship between leadership styles and

innovation in the TVET context, focusing on the contributions of four main leadership styles: transformational, inclusive, distributed, and authentic.

**Transformational Leadership**

As indicated by various studies reviewed here, transformational leadership plays a significant role in driving innovation in the TVET context. Transformational leadership fosters innovation by motivating individuals through a shared vision, empowerment, and attention to individual needs (Al-Husseini et al., 2021; Grošelj et al., 2021; Messmann et al., 2022). This style enables institutions to introduce cross-disciplinary innovative practices, such as digital training programs in the health sector and technology-based entrepreneurial development. Additionally, it enhances the institution's ability to adapt to changing industry and technological needs, for example, by integrating ICT into vocational education.

Findings from M Mohd Siraj et al. (2023) show that combining transformational and instructional leadership can create a framework that enables universities to function as innovation hubs. This framework is designed by TVET instructors to improve ICT integration, resulting in more innovative learning that is aligned with modern industry needs. These findings are consistent with Jafarov (2024), who emphasizes the role of third-generation universities in formulating strategic educational policies centered on innovation. Another study by Torres-Mancera et al. (2023) highlights that transformational leadership significantly impacts sustainable entrepreneurship in Spain and Portugal, where this leadership style enhances women's abilities to manage innovative startups. In addition, Pratama et al. (2024) note that transformational leadership substantially affects lecturers' motivation in government vocational higher education (GVHE) institutions in Indonesia, resulting in increased cross-boundary collaboration in health education. Michel et al. (2023) underscore the development of innovative online training programs for health professionals, where a transformational approach helps introduce boundary-spanning practices, strengthen international collaboration, and foster the application of innovative learning methods. In this context, transformational leadership motivates individuals to think creatively and facilitates the development of policies and frameworks that support the industry's and society's evolving needs.

However, research has noted several limitations in implementing transformational leadership in the TVET context. Mohd et al. (2023) indicate that the success of innovation frameworks depends heavily on external funding and policy support, which can be challenging for institutions in developing countries. Michel et al. (2023) note the limited generalizability of their findings due to focusing on a single case study. Additionally, Torres-Mancera et al. (2023) encountered sector-specific limitations, making applying their results broadly to vocational education difficult. Pratama et al. (2024) highlight the reliance on mediators for market integration, posing a significant challenge for ensuring the sustainability of innovation's impact. These findings suggest that while transformational leadership can enhance innovation, its effectiveness depends on the local context and the existing ecosystem's support.

**Transglobal Leadership**

Transglobal leadership is increasingly relevant in the TVET context, especially in an era of globalization that demands institutions adapt to dynamic international changes.

Transglobal leadership significantly contributes to innovation within TVET institutions by focusing on cross-cultural adaptation and global strategies. In vocational education, this leadership style facilitates international collaboration and adopting best practices from various countries. Research by Fiernaningsih et al. (2022) shows that transglobal leadership improves employee performance by integrating organizational culture, leadership, and innovation in Indonesian vocational higher education institutions. Such leadership aids organizational adaptation to global market requirements through strategic approaches and cross-cultural communication. Herijanto et al. (2023) highlight the role of transglobal leadership in fostering an innovation culture among TVET lecturers in Indonesia. This leadership style positively influences deep, work-based learning, such as clinical training and innovative technical skills. Furthermore, combined research by Fiernaningsih et al. (2023) indicates that transglobal leadership not only encourages innovative work behavior among lecturers and staff but also reinforces the development of soft skills such as communication, critical thinking, and collaboration—essential qualities for creating an innovation-oriented educational environment in the global era.

Nonetheless, some limitations exist in implementing transglobal leadership in the TVET context. Fiernaningsih et al. (2022) caution that their findings may not be generalizable to other school settings due to the study's focus on specific Indonesian institutions. Similarly, Herijanto et al. (2023) point out limitations in generalizing their results, as their data collection was restricted to a small group of lecturers within a specific work environment. The joint study by Fiernaningsih et al. (2023) also acknowledges challenges in ensuring the validity of research findings across diverse TVET institutions due to small sample size and limited data diversity.

**Inclusive Leadership**

Inclusive leadership emphasizes involving all organization members, valuing diversity, and creating an inclusive environment to foster innovation. Inclusive leadership stimulates innovation by leveraging diverse perspectives, enhancing collaboration among individuals, and cultivating an environment that encourages experimentation and critical thinking (Ahsan, 2024; Fang et al., 2021; Leroy et al., 2021; Nishii & Leroy, 2022; Widodo & Ciptaningsih, 2023). In a study by Y. Tang et al. (2023), inclusive leadership was applied in vocational colleges in China to boost innovation by developing explicit and implicit competencies within an inclusive work environment. This study demonstrates that approaches emphasizing cross-departmental involvement can generate creative solutions to challenges faced by vocational institutions, such as aligning local curriculum requirements with global market needs. The research also confirms that this leadership style integrates organizational engagement principles to build relevant skills among students and educators in vocational colleges.

Another study by Burt et al. (2023) shows that courses incorporating the principles of diversity, equity, inclusion, accessibility, and social justice (DEIAJ) at the postgraduate level can yield sustainable innovation. This study indicates that inclusive leadership fosters collective work dynamics, motivating participants to explore and implement new ideas, particularly within higher vocational education institutions. Research by Derk et al. (2023) supports these findings, showing that inter-institutional internship programs adopting inclusive leadership enhance innovation in educator development and provide a framework for institutional capacity building at local and regional levels.

However, implementing inclusive leadership in the TVET context faces some limitations. Y. Tang et al. (2023) note that their study's results are limited to colleges in Fujian Province, China, making it difficult to generalize to institutions with different characteristics. The study by Burt et al. (2023) focuses solely on a few selected TVET schools, potentially limiting the broader applicability of their findings to the wider vocational education landscape. Meanwhile, Derk et al. (2023) highlight that their approach is more focused on a specific region, which may reduce the relevance of their evaluation model and innovation outcomes for TVET institutions beyond that particular geographic context.

**Innovative Leadership**

Innovative leadership is a leadership style explicitly focused on developing and implementing innovation to drive organizational change, making it highly relevant to this review's objectives. Unlike other leadership styles that may regard innovation as a secondary outcome, innovative leadership directly prioritizes the generation of new solutions and creative approaches to address change (Abualoush et al., 2022; Alblooshi et al., 2021; Begum et al., 2022; Javed et al., 2021; Tan et al., 2024). For instance, Sutiyatno et al. (2022) demonstrate that innovative leadership significantly increases teachers' commitment to innovation in vocational schools in Magelang, Indonesia, by strengthening the development of intermediate-to-advanced competencies. This leadership style helps promote technology integration and skill-based learning, enhancing curriculum relevance to market needs.

Further, research by Chanprasert et al. (2023) identifies five primary components of innovative leadership: data-driven decision-making, team empowerment, and sustainability of innovation strategies. Their study underscores the importance of a systemic approach to constructing an effective innovation ecosystem, particularly within vocational higher education institutions in Thailand. Innovative leadership also facilitates the development of eleven core competencies to support innovation in vocational colleges, including creativity, cross-disciplinary communication, and industry collaboration. This provides a significant advantage over other leadership styles, especially in the TVET context, which focuses on developing workforce-ready skills.

Nevertheless, some limitations must be considered. The study by Sutiyatno et al. (2022) has limited generalizability due to its focus on vocational schools in a specific region of Indonesia. Chanprasert et al. (2023) also note that the Delphi method used in their research lacks clear guidelines, potentially affecting the consistency of findings. Furthermore, much of the research on innovative leadership tends to concentrate on local contexts, so the global application of these findings requires further testing.

**Distributed Leadership**

Distributed leadership emphasizes the involvement and empowerment of various organizational stakeholders to share responsibilities and decision-making. In the TVET context, this style has proven to support innovation by harnessing the collective potential of all organizational members. According to Fix et al. (2021), distributed leadership was implemented in TVET institutions to strengthen a collaborative culture, enabling local leaders such as principals and staff to play key roles in developing innovative curricula aligned with industry needs. This approach accelerates the institution's adaptation to labor market changes.

Ghirmai (2024) shows that distributed leadership significantly engages various stakeholders—such as teachers, students, and industry partners—in decision-making. Involving external partners, such as local companies, fosters innovation in training programs targeting specific skills demanded by the market. Such collaboration results in more innovative training programs, including technology-based curricula and personalized learning. This approach also enhances transparency and accountability in managing organizational resources, directly impacting the sustainability of innovation.

Despite many advantages, distributed leadership also faces certain limitations. Fix et al. (2021) note that implementing this style is often hindered by a lack of training for stakeholders to participate effectively in decision-making. Ghirmai (2024) acknowledges that their study's findings are limited due to having only two sample groups, affecting the generalizability of results. Another challenge lies in building trust and strong communication among organization members to ensure the successful implementation of distributed leadership.

**Managerial and Mentoring Leadership**

In the TVET context, leadership styles are crucial in driving innovation. Managerial leadership contributes through a structured, competency-based approach. Research by Papanai and Poolkrajang (2023) highlights how administrator-oriented leadership can promote sustainability in high-level innovation scholarship programs. Particular emphasis is placed on the values of women's leadership, such as empathy and adaptability, which are important factors in fostering innovation. These findings are reinforced by the study of Wei et al. (2024), which developed a competency model for professional group leadership. This study shows that structured leadership approaches can create adaptive innovation, primarily through competency strategies aligned with industry needs in the TVET sector. The outcomes of managerial leadership include sustainability in vocational education programs—enhanced by women's leadership values—and the development of competency-based models that improve professionals' readiness to face real-world challenges.

However, these studies have limitations. The study by Rinradee Papanai et al. was constrained by a small sample size, with only 26.5% female leadership represented, thus limiting the broader application of the findings. Meanwhile, the research by Chuanjia Wei et al. focused on specific geographical and institutional contexts, reducing the generalizability of its results.

Mentoring leadership has significantly impacted innovation development by improving emotional intelligence and leadership effectiveness. A study by Prummer, Human-Vogel, Graham, et al. (2024) in South Africa reveals that mentoring frameworks—individual, peer-group, and collaborative—can enhance emotional intelligence and leadership capacity. This creates a practical pathway for professional development in the TVET sector. Peer-group mentoring, in particular, significantly contributes to school principals' emotional and professional development, underscoring its value in promoting innovative leadership.

The impact of mentoring leadership includes increased collaboration, inclusivity, and distributed leadership that supports sustained innovation. Additionally, enhancing emotional intelligence plays a vital role in creating adaptive solutions and improving leadership effectiveness. However, limitations also exist. One study focused solely on the Eritrean context without qualitative insights, while another relied only on perceptions of

emotional intelligence. Consequently, the results may not fully reflect actual impacts in broader contexts.

## CONCLUSION

**Fundamental Finding:** This systematic literature review reveals that leadership styles drive innovation within Technical and Vocational Education and Training (TVET) institutions. Transformational, transglobal, inclusive, and innovative leadership styles are identified as the most impactful in fostering an innovation-driven culture, enhancing collaboration, and expediting technological adoption. Transformational leadership, in particular, excels in aligning vision, empowering individuals, and motivating teams to achieve sustainable innovation. Meanwhile, inclusive leadership emphasizes stakeholder involvement and collaborative creativity, while transglobal leadership supports cross-cultural adaptability and international collaboration. Innovative leadership prioritizes the creation of new solutions tailored to industry needs. The findings highlight the necessity for TVET institutions to adopt flexible and innovation-oriented leadership approaches to remain relevant in the rapidly changing labor market and technological landscape. Leaders capable of integrating strategic vision with active stakeholder engagement will be instrumental in sustaining innovation within the sector. Practical recommendations include fostering transformational leadership, integrating technology into leadership strategies, and developing innovation performance indicators to guide institutional progress. **Limitation:** The study identifies limitations in the generalizability of its findings due to the geographical focus and small sample sizes in many reviewed studies. These constraints limit the applicability of results across diverse contexts and sectors within TVET. **Future Research:** Further research should explore applying leadership styles across varying cultural and sectoral contexts to provide a more comprehensive understanding of their global relevance. Longitudinal studies examining the sustained impact of leadership on innovation outcomes in TVET would also be valuable for developing robust frameworks and strategies tailored to diverse institutional needs.

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