Menjelajahi Dua Dekade Kemajuan Penjaminan Mutu dalam Pendidikan dan Pelatihan Kejuruan

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Abstrak: Penjaminan mutu dalam pendidikan teknik dan kejuruan (PTK) menjadi perhatian, sebagai akibat perubahan tatanan pendidikan dan permintaan lulusan yang terampil dan siap kerja. Penelitian ini menyajikan analisis bibliometrik komprehensif penelitian penjaminan mutu PTK dari tahun 2003 hingga 2022. Data divisualisasikan menggunakan VOSviewer dan Tableau. Penelitian ini bertujuan untuk memberikan wawasan tentang distribusi kuantitatif, pola kutipan, penyebaran geografis, dan topik-topik yang muncul di bidang ini. Hasil studi menunjukkan peningkatan volume publikasi mengenai penjaminan mutu di PTK. Pola pengutipan menunjukkan bahwa kedalaman eksplorasi dan keterlibatan dengan pengetahuan yang ada tidak kuat secara proporsional. Federasi Rusia muncul sebagai kontributor utama dalam hal keluaran dokumen. Kurangnya kolaborasi penelitian internasional antar negara, menandakan perlunya peningkatan keterlibatan global. Tren yang teridentifikasi dalam penelitian dapat dikategorikan menjadi tiga kelompok. Klaster 1 berfokus pada aspek-aspek yang berkaitan dengan penerapan penjaminan mutu di PTK, Klaster 2 mendalami pendekatan metodologis dalam konteks ini, dan Klaster 3 mengeksplorasi konteks penelitian terkait dengan nilai, manfaat, atau tujuan penerapan penjaminan mutu di PTK. Artikel ini juga menyajikan refleksi atas temuan sebagai penelitian yang memerlukan eksplorasi lebih lanjut. Artikel ini dapat bermanfaat bagi para peneliti empiris yang ingin mengkaji evolusi tema penelitian yang berkaitan dengan penjaminan mutu dalam pendidikan kejuruan.

Kata-kata Kunci: Analisis Bibliometrik, Manajemen Mutu, Pendidikan Teknologi dan Kejuruan, Penjaminan Mutu, PTK.

Exploring The Two Decades Of Quality Assurance Advancement In Vocational Education And Training

Abstract: Quality assurance in vocational education and training (VET) becoming a concern driven by evolving educational landscapes and the demand for skilled and job-ready individuals. This study presents a comprehensive bibliometric analysis of research on VET quality assurance from the year 2003 to 2022. Data was visualized using VOSviewer and Tableau. This paper aims to provide insights into the quantitative distrubution, citation pattern, geographical dispersion, and emerging topics in this field. Results show an increasing volume of publications on quality assurance in VET. The citation pattern suggests that the depth of exploration and engagement with existing knowledge is not proportionally robust. Russian Federation emerges as a prominent contributor in terms of document output. A lack of international research collaboration among countries, signaling a need for increased global engagement. The identified trends in research can be categorized into three clusters. Cluster 1 focuses on aspects related to the implementation of quality assurance in VET, Cluster 2 delves into methodological approaches in this context, and Cluster 3 explores research contexts associated with the value, benefits, or objectives of implementing quality assurance in VET. This article also offers a reflection on the findings as research that necessitates further exploration. This article can serve as a valuable resource for empirical researchers seeking to examine the temporal evolution of study

participants and the shifting research themes pertaining to quality assurance in vocational education.

Keywords: *bibliometric analysis, quality assurance, quality management, vocational education and training, VET*

INTRODUCTION

In the context of an ever-evolving global landscape, the need for quality vocational education and training (VET) has become increasingly evident. The last two decades have witnessed an escalating demand for skilled professionals equipped with practical knowledge and expertise, reflecting the global need for a more competent and adaptable workforce (Jackson, 2010; Schön, 2017; NRC, 2012; Majewska, 2023). This requirement is underscored by the stark reality of a declining Human Development Index (HDI) in certain regions, often paralleled by a lack of attention to the quality of vocational education (Powell & McGrath, 2019; Ifeyinwa & Serumu, 2016). As a result, a growing number of vocational sector workers, who play a crucial role in the socio-economic development of nations, face reduced opportunities and limited career prospects (Tamers et al., 2020).

One of the disconcerting consequences of the inadequacies in vocational education is the predicament faced by a substantial number of VET graduates who find themselves unemployed or underemployed (Wang & Wang, 2023). This phenomenon underscores the urgency of addressing the deficiencies within the vocational education system. Improving the quality of vocational education is not only a moral imperative but also an economic necessity, as a skilled and capable workforce is pivotal for the sustainable development and progress of nations (Stephen, 2020). The enhancement of vocational education quality hinges significantly on the advancement of the quality assurance system, a critical component of any education and training framework (Makhoul, 2019).

Previous review research related to quality assurance or quality management in VET using the literature review method has been studied by (Agbola & Lambert, 2010; Handoyono, 2022; Glykas et al., 2015). The research results of Agbola & Lambert (2010) describe the effect that policy reforms have had on VET quality assurance, highlighting some of the opportunities and challenges that the Australian VET faces. Handoyono (2022) provide comparative analysis of formal and non-formal vocational education channels is conducted with respect to three criteria: curriculum, learning models, and quality assurance. Glykas et al. (2015) define quality as a broad concept and discuss several fundamental ideas related to its assurance and implementation. Furthermore, an assessment of the notion of quality management in Vocational Education and Training (VET) constitutes the second objective of this study. Furthermore, this article aims to communicate the findings that have been obtained and emphasizes the approaches being pursued by individuals interested in VET. Based on previous research, no one has mapped the development of research in VET quality assurance globally.

This paper embarks on an exploratory journey spanning two decades, employing a bibliometric analysis method to dissect and evaluate the trajectory of advancements in quality assurance within vocational education and training. Bibliometric analysis offers a quantitative lens to assess and understand the scholarly landscape, providing a wealth of benefits for researchers, institutions, and policymakers (Donthu et al., 2021). Additionally, bibliometrics contributes to quality assurance efforts by objectively evaluating research output and impact (Baas et al., 2020). By employing bibliometric techniques, we aim to unravel the trends, key contributors, and emerging themes that have shaped the discourse surrounding VET quality assurance

As we delve into this comprehensive exploration, our objective is to not only highlight the progress made but also to identify critical areas that warrant further attention and intervention. By synthesizing the data through a bibliometric lens, this paper aims to contribute to the ongoing dialogue on the improvement of vocational education by providing actionable insights for policymakers, educators, and stakeholders. Ultimately, the sustained advancement of the quality assurance system emerges as a linchpin in ensuring that vocational education meets the demands of the evolving global landscape, effectively addressing the challenges faced by individuals, industries, and nations alike.

Research Questions

RQ1 : What are the Quantitative distribution of publications in quality assurance or quality management in vocational education and training studies?

RQ2 : What are the prevailing patterns of citation in relation to quality assurance or quality management in vocational education and training?

RQ3 : What is the geographic dispersion of publications and the patterns of collaboration among nations in research pertaining to quality assurance or quality management in Vocational Education and Training?

RQ4 : What is the primary area of investigation concerning quality assurance or quality management in Vocational Education and Training? (keyword analysis)

RQ5 : How is the reflection for future work in field of quality assurance or quality management in Vocational Education and Training?

RESEARCH METHODS

This research use the bibliometric analysis to analyze the dynamics, research activities, and trends of research topics related to quality assurance or quality management in vocational education and training. Bibliometrics is a method of identifying scientific trends and systematizing research (Vílchez-Román & Mauricio-Salas, 2021). Most bibliometric analyses commonly utilize Thomson Reuters' Web of Science (WoS), PubMed, and Elsevier's Scopus as their primary data sources. In this research, the data source was retrieved only from the Scopus database. The rationale behind this is that Scopus provides a wider and more esteemed range of coverage in comparison to both Web of Science and PubMed. (Falagas et al., 2008; Mongeon & Paul-Hus, 2016; Yeung, 2019). The research process consists of three phases. In Phase 1, the search criteria are defined to identify records in the Scopus database, and the retrieved records are refined during the data collection phase. In Phase 2, the documents are refined with inclusion criteria. Finally, Phase 3 the document exported to the VOSviewer software (Version 1.6.19) and Tableau Desktop (Version 2023.3.0 Professional Edition) for conducting bibliometric analysis on publications, authors, countries, institutions, journals, and areas, thus facilitating data visualization. In this very end step involves data analysis to identify the primary themes discussed in the research conducted on quality assurance or quality management in VET.

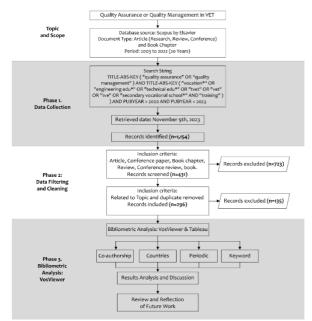The research procedure is shown in figure 1.

Figure 1. Research procedure

The data filtering and data cleaning process can be seen at the following link: https://bit.ly/DataFiltering-Cleaning91123.

RESULTS AND DISCUSSION

Quantitative distribution of publications in quality assurance or quality management in vocational education and training studies

Publications regarding quality assurance or quality management in VET are experiencing an increasing trend from year to year. Figure 2 shows the quantitative distribution of publications based on 296 documents that match the inclusion criteria. The increasing trend shows that awareness is growing from year to year. Research on quality assurance or quality management in VET is increasing along with the increasing demands of the employment market for VET graduates.
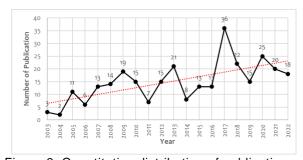

Figure 2. Quantitative distribution of publications between 2003 to 2022

Even so, research on related topics is still considered small. This can give rise to the assumption that the realm of research on

improving the quality of VET education has not yet been widely researched by scholars. Based on document type, the 296 documents were categorized into: conference paper (43.92%), article (39.86%), book chapter (9.12%), review (5.74%), and book (1.35%). The results reveal that there are still few reviews on the subject, which justifies the reason this work was created.

The minimal number of publications in quality assurance in VET can be caused by several things. Among them:

1. Underprioritization: In the broader landscape of educational research, vocational education may not always receive the attention and prioritization it deserves. Traditional academic pathways often overshadow vocational education, leading to a limited focus on quality assurance within this specific domain.

2. Perceived Complexity: Quality assurance in vocational education involves a unique set of challenges, given its emphasis on practical skills and industry relevance. Researchers might perceive the complexity of assessing and ensuring quality in hands-on, applied learning environments as a deterrent, leading to a reluctance to delve deeply into this field.

3. Limited Funding: Research activities, especially in specialized areas like vocational education, often depend on available funding. If there is a lack of financial support or dedicated resources for research in quality assurance within vocational education, it can impede the growth of scholarly work in this domain.

4. Policy and Recognition Gaps: The absence of robust policies and recognition frameworks for quality assurance in vocational education may contribute to the low research activity. Researchers may be deterred when there is a lack of clear guidelines and institutional support for investigating and implementing quality assurance measures in vocational settings.

5. Communication Gap Between Academia and Industry: Vocational education is inherently linked to industry needs. A gap in communication between academic researchers and industry practitioners can hinder collaborative efforts to address quality assurance challenges. This disconnect might result in a lack of real-world relevance in research endeavors.

6. Limited Academic Incentives: In some

academic environments, there may be limited incentives for researchers to focus on vocational education quality assurance. The emphasis on traditional academic metrics like publications in high-impact journals may not align with the applied and practical nature of vocational education research.

Addressing these challenges requires a concerted effort from educational institutions, policymakers, and researchers to recognize the significance of quality assurance in vocational education and provide the necessary support and incentives for robust research in this critical field.

The prevailing patterns of citation in relation to quality assurance or quality management in vocational education and training

Figure 3 shows a citation analysis of 296 publications related to quality assurance or quality management in VET. Publications are grouped according to year of publication and then analyzed for total citations and average citations per publication.
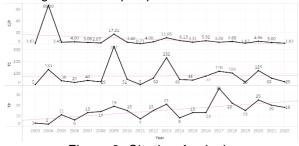

Figure 3. Citation Analysis

Notes. TP=total of publication, TC=Total Citations, C/P=Average Citations per Publication

The citation pattern also shows a different pattern from the total publication trend. Publications tend to increase each year while the number of citations does not change significantly. However, there are publication years that have a high number of citations, including publications in 2009 and 2013. To see more deeply the development of themes in vocational education and training quality assurance research, table 3 shows the top 10 cited articles.

Table 1. Top 10 Cited Article

No	Article Title	Insight	TC	Author
1	"The effectiveness of portfolios for	Portfolios can promote personal learning accountability and professional advancement,	158	(Gamboa & Melão, 2009)

No	Article Title	Insight	TC	Author
	post-graduate assessment and education: BEME Guide No 12"	according to strong evidence. Electronic items are better at encouraging introspective thought, therefore consumers spend more time with them. Even with competing time demands and skepticism about portfolios, regular mentorship boosts achievement. Summative assessments for portfolio data have varying inter-rater reliability, highlighting the need for more assessment methodologies to improve evaluation validity and accuracy. Insufficient evidence was available to determine portfolio efficacy in transdisciplinary environments.		
2	"Learning to work together: Using the presage, process, product (3P) model to highlight decisions and possibilities"	Biggs (1993)'s systems-form 3P (presage-process-product) model of learning and teaching is used to assess collaborative work educational interventions in this study. Discover and analyze presage, process, and product aspects. This argument proposes that understanding the complex network of elements that affect collaborative learning improves discernment and helps make better, faster decisions.	131	(Paton, Fluck, Scanlan, 2004)
3	"Vocational outcomes of an integrated supported employment program for individuals with persistent and severe mental illness"	Individual Placement & Support (IPS) participants had better vocational outcomes than TVR participants. The study found that integrated supported employment (ISE) improves supported employment outcomes. This suggests that occupational rehabilitation benefits from social skills training (SST).	80	(Killip, 2009)
4	"Interpretative commenting: A tool for improving the laboratory-clinical interface"	Ensuring the quality and safety of interpretative comments relies heavily on the proper training and education of laboratory workers. In addition, the implementation of quality assurance systems and the utilization of an adequate clinical audit are necessary for the assessment and enhancement of this undertaking.	65	(Ross et al., 2009)
5	"The coming of age for interprofessional education and practice"	The primary emphasis of the conference was on interprofessional competency frameworks. Additionally, the conference explored strategies aimed at effectively preparing students for interprofessional practice. Another key area of discussion was the customization of learning environments to facilitate interprofessional education. Lastly, the conference addressed the development of policies, infrastructure, culture, and faculty leadership necessary to support interprofessional education.	58	(Schmitt et al, 2013)
6	"Simulation training for improvi	The findings showed that participants liked the course but were nervous	56	(Plebani 2013)

No	Article Title	Insight	TC	Author
	ng the quality of care for older people: An independent evaluation of an innovative programme for interprofessional education"	about the simulated setting. The inclusion of human patient simulation increased staff trust.		
7	"Products, practices and processes: Exploring the innovation potential for low-carbon housing refurbishment among small and medium-sized enterprises (SMEs) in the UK construction industry"	The research suggests new practices and methods for refurbishing projects, generating challenges for further research on quality assurance, performance over time, standards, and vocational training.	56	(Tsang, 2013)
8	"Engagement and retention in VET MOOCs and online courses: A systematic review of literature from 2013 to	Six functional approaches for VET MOOCs were found. These functional techniques in VET MOOCs may boost learner retention and engagement.	48	(Freeth & Reeves, 2018)

No	Article Title	Insight	TC	Author
	2017"			
9	"The impacts and success factors of ISO 9001 in education: Experiences from Portuguese vocational schools"	This study found that vocational schools use the standard to set strategic direction and create plans. Bureaucracy is depicted more favorably than in previous study, and managerial dedication and support are not stressed as the main success factor.	34	(Tochel et al., 2012)
10	"Improving emergency preparedness system readiness through simulation and interprofessional education"	The study tested immersive simulations, developed credible emergency response and team communication assessment instruments, and assessed participants' skill retention and transfer across time.	32	(Miller, 2014)

Research that is widely cited in discussions in the field of quality assurance and quality management in vocational education has the theme of digitizing the quality documentation process (Schmitt et al, 2013), training simulations in improving service quality (Plebani 2013), encouraging environmentally based quality assurance innovation (Tsang, 2013) , digital learning innovation (Freeth & Reeves, 2018), implementation of ISO (Tochel et al., 2012), simulation of training quality maintenance during emergencies (Miller, 2014).

These influential works not only demonstrate the scholarly influence within the discipline but also encompass the shared knowledge and significant ideas that have influenced the discussion on quality assurance in vocational education. Upon thorough examination of the extensively referenced publications, a profound comprehension of the fundamental themes, methodology, and pioneering contributions will be attained, hence illuminating the progression and present condition of quality

assurance practices in vocational education. The shift from quantitative analysis to qualitative inquiry holds the potential to provide a diverse range of knowledge that will enhance and direct our understanding of efficient quality assurance systems in vocational education.

Geographic dispersion of publications and the patterns of collaboration among nations in research pertaining to quality assurance or quality management in Vocational Education and Training

Figure 3 shows the geographical dispersion of publications related to quality assurance or quality management in VET. Country data were selected based on the affiliation of the first author. The different co-authorship relationships are shown in Figure 4.

Figure 4. Geographical Dispersion.

Of the total 193 countries in the world, only 84 countries or 43.52% contributed to research that fell into the author inclusion category. Based on the results of analysis using Tableau, the Russian Federation has the most publications with a total of 31 publications (10.47%). This indicates that the Russian Federation is concerned with improving the quality of vocational education and training. As the Russian Federation's mission in VET is stated in the Technology and Vocational Education and Training (TVET) strategy 2012 and continues to this day "to enhance the quality of TVET and to establish an independent quality assurance system for TVET" (UNESCO-UNEVOC, 2012). Second place continues with Germany with 29 publications (9.80%), United Kingdom with 22 publications (7.43%), China with 21 publications (7.09%), United States with 20 publications (6.76%) and Australia with 16 documents (5.41%). These countries are countries with high VET rankings in the world. The remaining 78 countries only have under 10 publications. A valid conclusion can be drawn that countries with high concern have quality assurance in the VET sector as an indicator of the progress and quality of

VET.

The analysis continues by looking at the relationship between collaborative research between countries (Figure 5). Data were analyzed using VOSviewer with full counting method, Co-authorship by countries, Total thresholds of the 84 countries. For each of 84 countries, the total strength of the co-authorship links with other countries is calculated. In this visualization only the largest set of connected items consisting of 44 items are shown.

Figure 5. Network Visualization on Collaboration Between Countries

Table 2. Link Strenght on Collaboration Between Countries

Country	Clu-ster	Links	Total Link Strength	Publi-cations
United Kingdom	1	20	29	31
Russian Federation	11	2	2	34
Germany	8	10	17	31
United States	5	11	11	24
China	6	2	5	23
Australia	6	4	7	20

The study shows that even though the Russian Federation has the most published documents, the total link strength is far below other countries. This shows that the research was only carried out with domestic colleagues. On the other hand, the United Kingdom has many collaborations between countries with 29 total link strengths from a total of 31 publications. Other countries with the most connections are Germany and the United States. Meanwhile, other countries show a lack of research collaboration in the field of quality assurance in VET.

International collaboration in quality assurance research allows the sharing of diverse perspectives and exemplary approaches, improving our understanding of effective quality assurance systems. This type of collaboration helps identify global patterns and concepts that may be applied to specific educational contexts, advancing

global benchmarks. Multiple nations' resources enable extensive investigations and rigorous theoretical frameworks in collaborative research. A collaborative approach improves global education quality, fosters innovation, and promotes improvement (Stevenson & Cornelius, 2014; Slowikowski et al., 2018; Chen et al., 2021). Therefore, this method is crucial to the growth of vocational education quality assurance.

The primary area of investigation concerning quality assurance or quality management in Vocational Education and Training (Keyword Analysis)

To ascertain the extent of effort and primary research themes relating to quality assurance and quality management, it is crucial to delve into each document and extract their principal keywords. Conducting this analysis is crucial for discerning patterns in developing themes and pinpointing focal points that hold potential as subjects for further investigation, advancement, and invention. Data were analyzed using VOSviewer with full counting method. Total 2188 keywords retrieved, minimum number of occurrences of a keyword is 5 and 94 meet the threshold. Keyword network visualization shows in Figure 6.
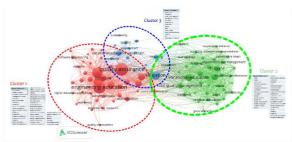

Figure 6. Keyword network visualization

Figure 6 illustrates the appearance of keywords and the relationship between one keyword and other keywords. A keyword's prominence shows how often the keyword appears in the retrieved documents. The visualization results show that there are three interrelated clusters.

The first cluster consists of 48 keywords, the most dominant of which are "quality assurance" and "engineering education". This is because this keyword is used by the author as a search string. The research focus on this cluster is related to curriculum, accreditation, industry, and economics. In general, these clusters discuss aspects that are assessed in the context of implementing quality assurance in

VET. Quality assurance in vocational education encompasses a multifaceted approach, addressing various critical aspects to ensure the effectiveness and relevance of educational programs. Curricula serve as the foundation, and their continuous evaluation and enhancement are integral to meeting industry needs (Abbas et al., 2021). Accreditation mechanisms provide external validation, ensuring that vocational education institutions maintain high standards (Kayyali & Koshla, 2021). Economic considerations also come into play, as the return on investment in vocational education is closely tied to the alignment of curricula with market demands, ensuring graduates are well-prepared for the workforce (Li & Pilz, 2023)

The second cluster consists of 37 keywords, the most dominant ones appearing in this cluster are "vocational education" and "education". These two keywords are related to research on total quality management, standards, methodology, procedures, evaluation, and organization. This cluster generally discusses keywords with research directions regarding methodology approaches in implementing quality assurance in VET. Each country has different instruments and approach methods in carrying out quality assurance in VET (Lim, 2018). Quality assurance in vocational education is a multifaceted endeavor, encompassing various key elements to ensure the delivery of effective and relevant programs. Total Quality Management (TQM) serves as a guiding philosophy, emphasizing the continuous improvement of processes and the active engagement of all stakeholders (Abbas, 2020). Standards play a crucial role, establishing benchmarks that define the expected level of quality in vocational education offerings (Morris, 2013).

The Third cluster consists of 14 keywords, the keywords that appear most frequently are "education" and "education". Several keywords relate to employment, skills, and innovation research. In this cluster, research contexts are found that are related to value benefits or the objectives of implementing quality assurance in VET. Quality assurance in vocational education and training (VET) plays a pivotal role in shaping a workforce that is not only employable but also equipped with the necessary skills to thrive in a dynamic and innovative landscape (John & Yusri, 2021). The assurance of quality in VET programs

ensures that graduates enter the job market with a solid foundation of practical skills and industry-relevant knowledge. Employment outcomes are directly linked to the effectiveness of VET quality assurance, as employers seek individuals with the right skills to contribute meaningfully to their organizations (Moldovan, 2013). Innovation, a driving force in today's rapidly evolving industries, is fostered by a high-quality VET system that adapts to emerging trends and integrates cutting-edge technologies into its curriculum. By emphasizing quality assurance in VET, we not only enhance the employability of individuals but also contribute to the broader societal goal of fostering a skilled, adaptable workforce that drives innovation and economic growth.

Reflection and Future Work

Reflecting on vocational quality assurance research provides an opportunity to assess achievements, challenges, and implications for future endeavors. In reviewing the research landscape, it becomes essential to recognize the strides made in understanding and improving the quality of vocational education. Successful implementations, identified best practices, and the impact of quality assurance initiatives on student outcomes are valuable insights garnered from existing research. However, challenges such as the need for more standardized assessment methods, the integration of emerging technologies, and ensuring equitable access to quality vocational education require further attention.

Future work in vocational education quality assurance research should prioritize addressing these challenges while embracing new opportunities. Research endeavors could delve deeper into the effectiveness of technology-driven assessment tools and explore innovative approaches to ensuring relevance in rapidly evolving industries. Additionally, there is a need for a more comprehensive understanding of the socio-economic impact of quality vocational education. Collaboration between researchers, policymakers, and industry stakeholders should be emphasized to bridge gaps and align quality assurance practices with the dynamic needs of the workforce. As vocational education continues to play a pivotal role in shaping skilled professionals, ongoing research efforts should aim to provide actionable insights, informed by both quantitative and qualitative methodologies, ensuring the continuous enhancement of quality assurance practices in this critical educational sector.

CONCLUSION

Despite the increasing volume of publications on quality assurance in vocational education and training (VET), research in this area remains relatively limited, suggesting that the field of VET quality improvement has yet to be extensively explored by scholars. This is further supported by the citation pattern, which shows a disconnect between the growth in publications and the number of citations. However, the Russian Federation's high publication output indicates a strong commitment to enhancing VET quality. Countries that prioritize VET quality often employ quality assurance measures as a gauge of progress and achievement. Nevertheless, the study reveals a striking discrepancy between Russia's prolific publication record and its relatively low total link strength, suggesting limited research collaboration within the country. Meanwhile, other countries, despite their lower publication output, demonstrate stronger collaborative ties. The study's findings can be categorized into three distinct clusters of concern. Cluster 1 encompasses aspects evaluated during the implementation of VET quality assurance initiatives. Cluster 2 focuses on methodological approaches to VET quality assurance, while Cluster 3 delves into the value benefits and objectives associated with implementing such measures.

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