

TQM and Excellence Models in Public Sector in Context of Sustainability: A Bibliometric Analysis

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Abstract. *This article focuses on Total Quality Management and Excellence Models (TQM and EM) in public sector research, revealing an analysis of existing literature in this area. Considering that the majority of publications on TQM and EM encompass the private sector and the sustainability subject becomes increasingly important, there is a need for advanced research on literature that assesses the interaction between quality models and sustainability in the public sector. The bibliometric analysis method is applied to display the current knowledge in the field, the results accomplished by previous studies, the most current trends and existing gaps in the literature. Retrieving 1677 articles from Web of Science between 1992 and 2024, this paper applies VOS viewer to detect the conceptual structure of the domain, to analyse the evolution of publications in time, highly cited literature and relevant journals. The results show publication outputs of the most cited works and authors, journals and research fields, the research trends and the most used keywords. This paper provides scholars with a compilation of the TQM and EM in the public sector research field and proposals for a new contribution on this topic. It helps to fill the literature gap regarding the lack of studies on the subject of study. There was interest for this field from 1992 but the importance of sustainability aspects is acknowledged in recent research. On the other hand, a specific interest for these models was identified in education and health care services.*

Keywords: TQM, Excellence Models, Public Sector, Sustainability, Review, Bibliometric.

Introduction

'Quality' may be a subjective term for each organisation considering their area of work, but the common understanding of it consists of principles, practices, and tools that combine values such as continuous improvement, customer focus and decisions based on objective data (Siva et al., 2016).). TQM is a managerial theory that has evolved from the TQC (Total Quality Control) concept defined by Feigenbaum (1991) as an effective system for assimilation of quality development and quality-improvement efforts of the people in an organisation to facilitate production or service at the most economical cost, which assured a full customer satisfaction. In line with Lim et al. (2022) approach, TQM has been framed over time into two different main perspectives, firstly as a model of business excellence and secondly as a comprehensive management strategy that focuses on customer satisfaction through tools and practices that guarantee continuous improvement in a constantly changing environment of the organisation. To define TQM that incorporates the concept of sustainability, Silvestri et al. (2024) through a systematic literature review assign TQM as a management philosophy that has the aim of meeting and satisfying the needs of all stakeholders relaying the continuous improvement of the organisation's quality and human relations to achieve competitiveness on the social, environmental and economic dimensions while respecting the purpose of sustainable development.

There are several studies that examine the application of quality management systems (QMS) such as EFQM (European Foundation for Quality Management), TQM, ISO 9000&9001 (International Organisation for Standardisation), and CAF (Common Assessment Framework) in the public sector (Baschung, 2024; Alicja & Renata, 2020; Asensio et al., 2021).). According to

Eriksson (2015) organisations from the private sector implement QMS in a better way compared to the public sector considering the variables as leadership, information analysis, business planning, coworker, process management, business results and customer satisfaction. At the same time, Xanthopoulou et al. (2023) states that the above-mentioned variables are helping public organisation to improve citizen satisfaction and facilitate management staff motivation, to reduce costs and overall organisational performance.

There is extensive research on evaluating the TQM and EM implemented in the public sector (Baschung, 2023; Mesgari et al., 2017), but very few articles describe sustainability as an important variable (Taraza et al., 2023). Since TQM has a significant impact on sustainability performance in the public sector, this paper attempts to carry out a systematic review of the TQM and EM in the public sector through bibliometric assessment and content analysis regarding the next research questions:

RQ1. *How has research on TQM and EM evolved in the public sector over the past years?*

RQ2. *Which journals, articles and authors have exerted the highest influence on research regarding TQM and EM in context of sustainability in the public sector?*

RQ3. *What are the most researched excellence models for public institutions, and what defining aspects emerge from recent academic studies?*

To answer these research questions, this study uses conventional bibliometric methods, which provide an overview of published research based on citation analysis and on the evaluation of publication outputs of journals, countries, institutes, and research fields. Recently, regarding the TQM and EM subject, the literature presents use of bibliometric analysis in articles done by Zang, Moreira & Sousa (2020) in research on the use of TQM in services, Ho et al. (2023) in research on trends of TQM in education system, Sa et al. (2023) who study excellence models towards sustainable development in business, Oliveira & Gomes (2024) who conducted a bibliometric analysis on the evolution of excellence models beyond TQM, etc. This study is different from the above-mentioned bibliometric articles because it deals with the implementation of TQM and EM in the public sector in the context of sustainability. It does not limit the research period, including all articles published in scientific journals indexed in Web of Science, with the areas of research restricted to economy, public administration, sustainability, accounting, management, ethics, social science, education. This comprehensive selection guideline was essential to record the broad scope of TQM and EM in public sector research.

The next section provides a summary of the existing literature on TQM and EM. In the following section, the article presents the methodology of study detailing the selection criteria, data cleaning process, and methods for data analysis. The third section examines the results obtained from historical, citation and bibliometric analysis of the articles. The final section summarizes the main conclusions, contributions, and limitations of the study.

Literature review

Total Quality Management (TQM) became a central strategy for improved organisational performance for both the private and public sectors. Existing economic, social and environment circumstances determine the path of evolution of the TQM models to support a sustainable development of an organisation. Dahlgaard et al. (2018) confirm that an organisation can reply to external pressure by using TQM and sustainable practices together. The direction towards digital transformation and sustainable development, as stated by Olivera & Gomes (2024), led to the

development of excellence models derived from TQM practices. These models serve as tools for autonomy, highlighting organizational competitiveness and addressing contemporary challenges (Xanthopoulou et al., 2024). These models facilitate inclusion of artificial intelligence and automatization in service delivery, improving this way process efficiency and facilitating achievement of sustainability goals. EFQM 2020 has proven to be one of the efficient models with a goal to evaluate performance and sustainability, especially in the education area (Sutoova et al., 2022).

Excellence models are seen as fundamental strategic tools for organisations that are centred on six thematic streams: quality management, sustainability, digitalisation, organisational performance, innovation, and managerial education (Olivera & Gomes, 2024). Researchers affirm that the development of excellence models toward sustainability is possible based on the following key factors: progressive leadership, active engagement of employees, organisational strategy, expanding citizen interest, qualitative procedures, and level of process digitalisation (AlShehail & Khan, 2020; Taraza et al., 2023; Ho et al., 2023).). In the same time, literature describes the challenges faced by an institution which try to implement an excellence model, barriers like aversion to change, budget constraint, and lack of staff competencies (Baschung, 2023). These constraints combined with cultural barriers reduce the positive impact of an EFQM model (Mesgari et al., 2017).

The academic literature demonstrates through multiple studies that the implementation of the excellence model has an effect on the performance of the organisation. is crucial in sustainable development but can serve as both a facilitator and an impediment especially for those with deficiencies in the logistics department (Baschung, 2023). According to Zhang (2018) long-term success is provided by quality services that we can ensure just with technological innovation that includes automatization and artificial intelligence. Xanthopoulou et al. (2024) state that Knowledge Management integrated within an excellence management model can determine an increase in citizen satisfaction and better internal performance of the public sector.

After three decades of studies on TQM and EM in the public sector, there are yet unanswered questions regarding this subject. Moreover, previous review articles do not integrate sustainable variable and public sector in their research. Therefore, although organizational excellence is already a well-established area of research, this article seeks to highlight the key attributes and the most commonly used quality models in the public sector, incorporating aspects of sustainability. To achieve this objective and overcome the limits identified in the literature, this paper makes a review through a bibliometric analysis of articles from Clarivate Web of Science (WoS) in the time frame 1992-2024.

Methodology

To see the progress of scientific knowledge regarding TQM and EM in the public sector, and their relationship with sustainability, the study conducted a literature review of works published from 1992 to 2024, listed in Clarivate's Web of Science (WoS). This review used the data cleaning methods outlined by Oliveira & Gomes (2024) and Zhan et al. (2021) to determine the final number of publications, and employed the data analysis methodologies of Sa et al. (2023) and Ho et al. (2023). Bibliometric analysis is considered the most objective tool for obtaining an overview of the literature, due to the use of quantitative analysis and evaluation protocols, because it efficiently summarises the development status of a journal or domain (Donthu et al., 2022; Jiang et al., 2024). Taking into account these advantages, this study implements the methodology mentioned above to analyse key topics of TQM and EM in the public sector and the historical evolution of the literature

on this topic, and also discusses bibliometric indicators such as number of citations, publications, countries and impact factors.

Data collection was performed from 12th November 2024 to 13th December 2024. The searched words were 'TQM' and 'public sector' and 'sustainability'. In order to expand the database for bibliometric analysis, given the limited number of publications that simultaneously address these themes, the research combined these terms, resulting in three Excel databases that were subsequently merged into a final database containing 1677 articles. Figure 1 outlines the criteria applied. As a result, after following the guidelines and removing articles that were not in English, were incomplete, or lacked sufficient citations (at least 10), the study utilized the approach of Zang et al. (2021), which involves reviewing the titles and abstracts of the remaining 557 articles and excluding those that do not refer to the purpose of the study. At this final stage of database cleaning, articles are classified into three categories:

'Yes', the topic of the article is related to the implementation of TQM and EM in the public sector;
'Not sure' - The topic of the article is probably related to the implementation of TQM and EM in the public sector
'No' –the topic of the article is clearly not within the scope of this study.

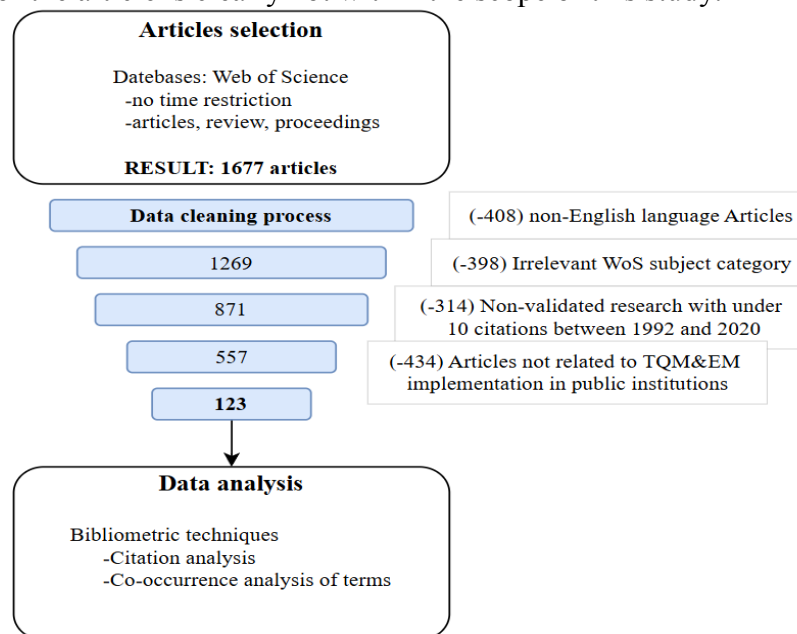


Figure 1. Methodologic processes

Source: Authors' own research.

The content analysis of the abstracts led to the exclusion of 434 articles that were classified as 'Not sure' and 'No'. Following the search protocol, from the initial number of 1677 articles from WoS, the study analyses 123 articles representing literature on TQM and EM implementation in public sector.

Subsequently of the cleaning stage, the study follows the data analysis stage by using VoS Viewer for bibliometric. Firstly, the study identifies the most relevant journals, authors, and articles and also follows the evolution in time of publications about TQM and EM implementation in the public sector. To describe the foundational themes of the research topic were utilised citation and co-citation. Given that co-word tool is used to build a conceptual structure of the domain and establish relationships between key words assuming that terms consistently appear together and

are in a thematic relationship (Oliviera & Gomes, 2024), the study use it to outline the thematic structure and future research direction.

Results and discussions

The subject researched in this article is quite new, this is why for the interpretation of the results were utilized articles that discussed implementation of TQM models in public sector or study which presents the initial sign of sustainability awareness in this sector. Additionally, to maintain a wide view of the results while ensuring precision in relation to the aims of this study, the analysis of the results was included within the broader perspective of general quality service.

RQ1. *How has research on TQM and EM evolved in the public sector in the past years?*

The inception and evolution of published articles linking the TQM and EM with public organisation and sustainability concept is presented in Figure 2.

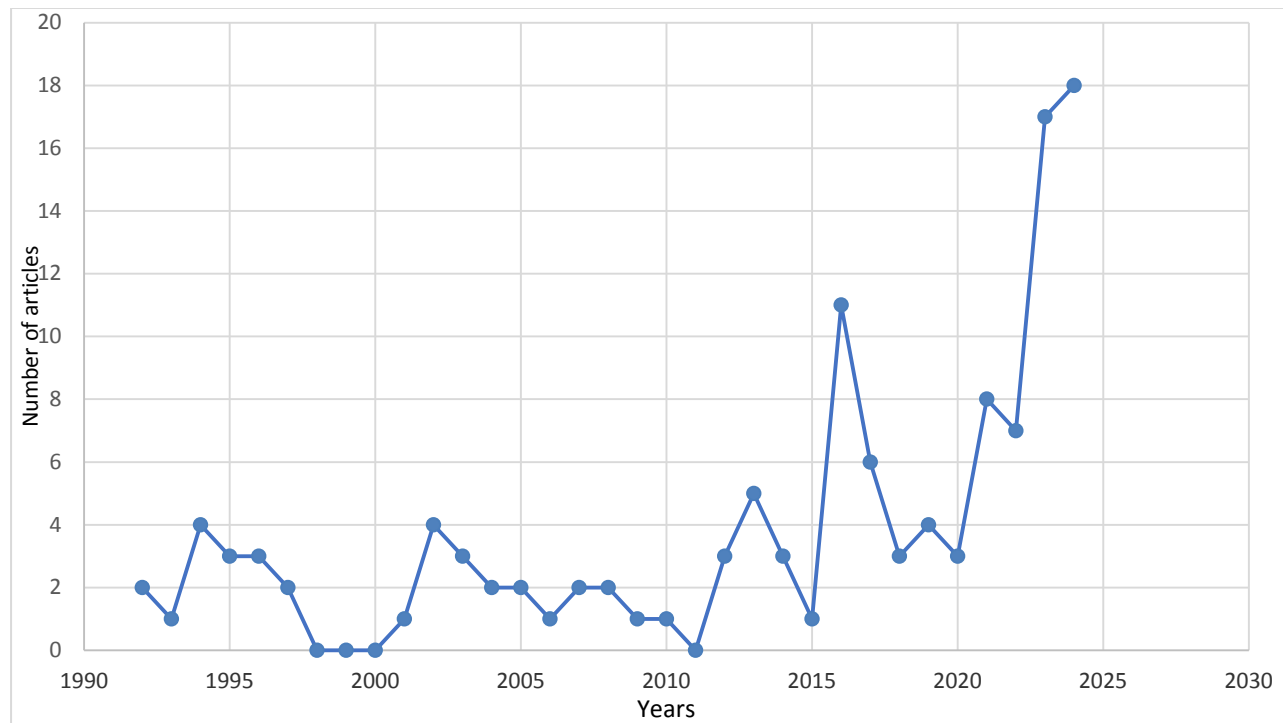


Figure 2. Evolution of research on TQM and EM in the public sector

Source: Authors' own research.

As shown in Figure 2, publications on TQM and EM implementation in public sector do not have a continuous ascending trend in the number of articles published from 1992 to 2024, but the overall trend fluctuates upward overall. Most of the articles, 40.65%, were published in recent years 2021-2024. In contrast to Taraza et al. (2023) conclusion on quality system implementation in public and private sector, which claims a continuing evolution of number of articles from 2004 to 2023, Figure 2 shows another result. The authors mention the fact that the private sector has more interest in applying quality models, which they also count in their analysis. Thus, comparing their results with present results, we can conclude that at the beginning of the quality management system implementation there were more publications for the private sector. Jiang et al. (2024) registered a similar growth in 2018-2022 for publications in the Journal of Quality Management & Business Excellence. The most similar results are with the Zang et al. (2021) study that describes

literature on use of TQM in service area as a continuous increase from 1990 to 1996, which means that this subject gradually gained attention among the academic field. Further, their study and Figure 2, present a decrease in the following 3 years and, afterward, by irregular ups and downs in the following years. Besides, the number of publications classified as review is insignificant, represent 6% from the total and were mainly from 2022-2024. The majority of the studies are case studies and empirical research.

RQ2. Which journals, publications and authors have exerted the highest influence on research regarding TQM and EM in context of sustainability in the public sector?

Table 1. Top productive journals

Journal Name	Category	IF	FY	IY	LY	TP (%)
Total Quality Management & Business Excellence (Tqm&Be)	Q2 Q3 Q4 Management	3.6	2003	2003	2024	31(25,2)
TQM Journal	Q2 Management	3.8	2008	2021	2024	15(12.2)
Public Administration Review	Q1 Q2 Public Administration	6.1	1997	1992	2024	9(7.32)
International Journal of Quality & Reliability Management	Q2 Management	2.7	1984	2011	2024	7(5.69)
Total Quality Management	Management	0.29	1997	1995	2024	6(4.88)
Sustainability	Q3 Green & Sustainable Science & Technology	3.3	2013	2019	2024	5(4.07)
Others			-	-	-	50(40.65)

Notes: IF: impact Factor; FY: the founding year of the journal IY: the initial year when an article about TQM and EM in public sector was cited in the Journal; LY: the latest year when an article about TQM and EM in public sector was cited in the Journal; TP(%): total number of publications

Source: Authors' own research.

Regarding the journals that present most articles referring to total quality management models in the public sector with incentives to sustainability, Table 1 presents the top 6 journals along with their title, category, impact factor (IF), founding year (FY), and the initial and the latest article published on the research topic. In Table 1, TQM & BE Journal and TQM Journal includes the most numerous studies on TQM and EM in public sector in context of sustainability subject compare to the other journals. Among the indicators, the values of discipline and impact factor are extracted from the latest data from WoS for 2023. The ranking of journals in Table 1 is based on the number of articles published in each journal. Initial year, and last year of published article about the subject of study show the attention given to and the continuity of TQM and EM in the public sector in the context of sustainability research (Jiang et al., 2024). The Public Administration Review Journal contains one of the oldest articles in this area and has in the same time the best impact factor, indicating that it is an influent and prestige journal. In the article, Swiss (1992) is concerned about incompatibility of the TQM models to the public sector and proposes an adjusted model.

Almost 5 of the journals are in management category and only 1 is in environmental sciences discipline. Most of them are in the second and third quartiles, indicating a lower impact factor of the journals and focus on the TQM subject illustrates a concentrate interest about this subject just in this area, which demonstrate a lack of studies.

The rest of the journals grouped as OTHERS category contain between 1 to 4 articles. It is important to mention that almost 45% of the journals have quality management and management discipline, while 25% of them have a public sector discipline and just 7% are about sustainability.

This distribution shows how sustainability journals are not so interested yet in presenting which are the public sector path towards sustainability through an excellence quality model. There are also other journals that explore this domain with discipline such as business, accounting, economics, education and marketing.

Table 2. The most cited articles on TQM and EM in the public sector

Article	YEAR	Type	TC	NI	NA	NR
Public Management in Time: A Longitudinal Examination of the Full Range of Leadership Theory	2014	Article	162	1	1	61
Implementation of TQM and lean six sigma tools in local government: a framework and a case study	2005	Article	154	1	2	16
Adapting total quality management (TQM) to government	1992	Article	150	1	1	38
The effect of TQM practices on employee satisfaction and loyalty in government	2010	Article	100	2	3	79
A critical evaluation of the EFQM model	2011	Article	96	2	3	61
Quality in higher education - A survey	1996	Article	73	1	2	35
The evolution and convergence of total quality management and management theories	2018	Article	68	2	3	46
Perceived quality in higher education: an empirical study	2013	Article	62	3	3	60
Relationship between organizational commitment and EFQM business excellence model: A study on Turkish quality award winners	2007	Article	53	2	2	87
At last, an alternative to performance-appraisal - total quality management	1994	Article	53	1	1	84
Development of an integrated total quality management and performance measurement system for self-assessment: A method	2002	Article	43	1	1	34
Exploring quality challenges and the validity of excellence models	2016	Article	43	6	8	69
A review of the quality evolution in various organizations	2017	Review	42	1	3	74
TQM emphasizing 5-S principles: A breakthrough for chronic managerial constraints at public hospitals in developing countries	2007	Article	42	4	6	19
TQM as a focus for improving overall service performance and customer satisfaction: an empirical study on a public service sector in Malaysia	2004	Article	41	1	1	34
Key success factors for quality management implementation: evidence from the public sector	2016	Article	40	2	2	60
The EFQM Model as a framework for total quality management in healthcare: Results of a longitudinal quantitative study	2016	Article	39	1	5	56
Municipal commitment to total quality management - a survey of recent progress	1995	Article	38	1	2	46
An integrated approach between Lean and customer feedback tools: An empirical study in the public sector	2013	Article	37	1	3	49
Understanding Total Quality Management in Context: Qualitative Research on Managers' Awareness of TQM Aspects in the Greek Service Industry	2007	Article	37	2	2	85

Notes: TC: total citations; NI: number of institutions; NA: number of authors; NR: number of references.

Source: Authors' own research.

Highly cited articles represent the superior ideas on a subject from leading researchers that helps to visualise the most important aspects on a theme and provides a robust framework for future studies. Extensive assessment of these highly cited works about TQM and EM in public sector can offer significant insight into the academic contribution of a paper in the research field.

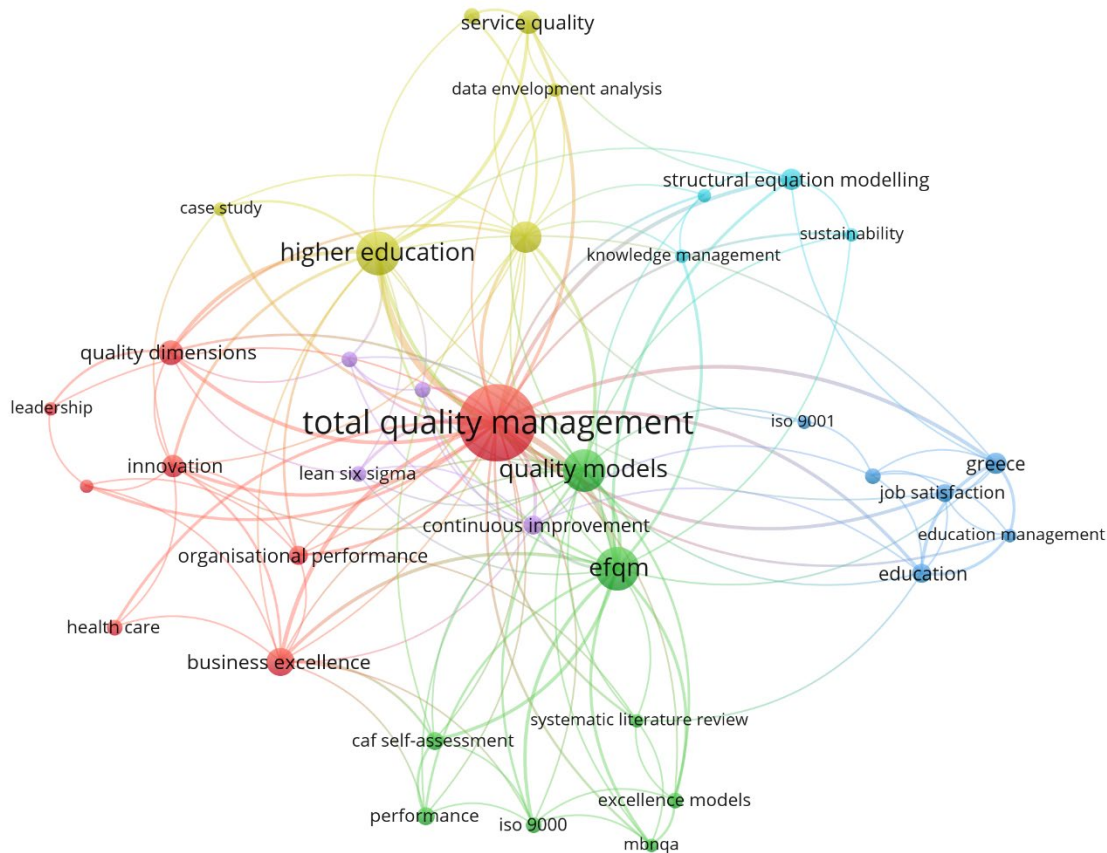
Table 2 presents the 20 most cited articles of TQM and EM from 1992 to 2024, including identifying details such as the title, publication year, topic, total citations (TC), number of institutions (NI), number of authors (NA) and number of references (NR). There are four articles

with more than 100 citations. The most cited article though a longitudinal analysis demonstrate how leadership theory is applied in a public organisation outlining the positive association between an improved leadership and satisfaction of citizens, cooperation, and perception of work quality for employee (Oberfield, 2014). The second-ranked paper (Furterer & Elshennawy, 2005) provides an example of implementation of Six Sigma and Lean Enterprise tools in a local government that help increase productivity and quality of financial services. The next two papers (Swiss, 1992; Chang et al., 2010) examine the importance of TQM implementation in a public organisation based on correlation between employee satisfaction and loyalty and their empowerment, compensation, and cooperation. Ranked fifth with 96 citations, the paper (Gomez et al., 2011) proposes a comparative analysis of the implementation of EFQM in the public and private sector and correlation between enablers and results of the model that seems to be insufficient for two of the results variables. Additionally, the public sector and educational institutions demonstrate slightly worse performance than private companies.

Highly cited publications focus more on presenting findings at the theoretical level defining theorems, confirm new concepts, properties, and methodologies, creating this way paths for future practical application and theoretical research. Half of these 20 literatures examine TQM in various contexts, such as its implementation in a central local government, intersection with management theories, its effect on employee satisfaction and loyalty, success factors of its implementation, as facilitator for an overall improvement in a public sector. Several papers pay attention to the EFQM model in order to measure and strengthen the quality of service, process performance, and verify the applicability and suitability of it in practical cases. Overall, these papers significantly contribute to build theoretical quality management framework and present quality management systems applied in the public sector that support potential research and knowledge growth in this field.

RQ3. What are the most researched excellence models for public institutions, and what defining aspects emerge from recent academic studies?

Keywords are seen as the core representation of an article as they accurately express its main topics. Figure 3 presents the keyword co-occurrence network generated with VOS viewer software in the field of TQM AND EM in public sector research between 1992 and 2024.



Figure

3. Keywords co-occurrence analysis

Source: Authors' own research.

A total number of 36 unique keywords were detected in the 123 articles included in the analysis. The condition to be counted for this network analysis is that a keyword emerges at least three times, and the clusters determined by different colours in Figure 3 are presented in order of importance. Based on the outcomes delivered by the bibliometric graph it can be observed that the keyword with the highest number of occurrences is *total quality management* that co-occur with all the others keyword except *iso standards*, *iso 9001* and *knowledge management*. This large co-occurrence validates the TQM practice as a foundation for excellence models in the public sector. Concurrently, it reflects the great importance that academic research refers to in these area (Jiang et al., 2023).

Likewise, the most encountered excellence models used in public sector resulted from bibliometric analysis are *EFQM*, *ISO standards* like *ISO 9000*, *ISO 9001*, *MBNQA*, *Lean Six Sigma*, *self – assessment CAF* model. Sa et al. (2023) identify, in addition to the results of the present study: Shingo model, Deming model and Baldrige model, with specification that their sample include the private sector. Taraza et al. (2023) reached with their study three models that are used in public sector in order to achieve sustainability, specifically EFQM, Six Sigma and Lean Sigma.

The areas of the public sector most analysed in Figure 3 are education, especially higher education, and health care. The aspects that are the most frequently considered to explore of the TQM are aspects that refer to leadership, innovation, sustainability, quality dimensions, job

satisfaction, knowledge management, and self-determination. Alateyyat et al. (2024) highlight more aspects of TQM, referring to public, private and third sector, among which the aspects mentioned above can also be found. They identify in literature a major concern for competitive advantage, contextual factors, external environment, innovation, knowledge management, organisational culture, organisational learning, performance measurement systems, strategic orientation, sustainability, leadership etc. Figure 3 identifies the methodology most used for research such as case studies, data development analysis, structural equation modelling, and systematic review of the literature. According to Alateyyat et al. (2024) most of the studies are quantitative, while qualitative and mixed methodology are used approximately in the same proportion.

Regarding the country of researches, the review reveals that most of the articles are analysing the Greece public sector where Psomas et al. (2024) study the impact of service centres quality on citizens' satisfaction and the what role has citizens' demographics with these centres. Mitsiou & Zafiropoulos (2024) look after the results of EFQM 2020 implementation, Kaiseroglou et al. (2024) and Bouranta et al. (2024) analyse quality assessment in educational organisations.

Conclusion

The paper aimed to present an extant literature review on TQM and EM in the public sector in light of sustainability. The evolution is assessed for the period 1992-2024, in order to illustrate the whole evolution of the literature from the Web of Science data base by the time frame. Bibliometric analysis provides proper answers to the three research questions raised in the introduction section. Based on prior research, the results are verified, their accuracy relied on the evolution of research, in accordance with research trend, and the public sector scholars focused on. The methodology and research process described allowed for a joint analysis of the main gaps in TQM and EM toward sustainability proposed by various authors. Taking into account the results and the common ground of the two topics, it was possible to reveal the status of actual research on the relation between TQM and EM in sustainability context. The attention dedicated by the literature to sustainability and quality management models over the last thirty years, demonstrated by the numerous journals and publications on the subject, justifies a bibliometric analysis to assist researchers in identifying the most relevant papers and authors in terms of citations, the most productive journals, the most important topics, gaps in this area of research.

The results show that until 2010 the average number of studies has remained stable to a low level, indicating that TQM and EM in the public sector is a moderately relevant topic that is present in the academic community. In 2016, 2023 and 2024 there is a peak of publications due to the expanded utilisation of excellence methodologies in public administration across different regions and accelerate digitalisation for administrative post-pandemic transformation. The research fields mainly focused on this subject are management and public administration, although the most cited journals belong to these disciplines. *Total Quality Management & Business Excellence Journal* is the most productive (Ho et al., 2023) while the journal that have published the most cited article is *Journal of Public Administration Research and Theory*.

The analysis of the most cited articles identifies the fundamental theories for this subject, more precisely leadership (Oberfield, 2014), management and convergence (Dahlgaard-Park, 2018) and resource-based view theory (Al-Dhaafri & Alosani, 2020). Furthermore, it is underlined that the field of education and health care is the domain in which the study identified the most interest. The EFQM model seems to be one of the most appreciated of all the excellence models presented. The co-occurrence of keyword assessment highlights that the TQM model represents

the foundation for excellence models described in the scientific literature. The analysis presented the most representative keywords for TQM and EM that refer to innovation, sustainability, leadership, performance, and job satisfaction. The most analysed excellence models by the academics are EFQM, ISO standards like ISO 9000, ISO 9001, MBNQA, Lean Six Sigma. This observation can be explained by the fact that the majority of the publications encompassed in this study dataset approach the European countries.

This review of the literature is realised to fill the gaps identified by Taraza et al. (2023), Alateyyat et al. (2024) on the specific subject of sustainability in the context of excellence models in the public sector. It reveals for future researchers the main areas of the existing studies and the characteristics to consider when applying a quality management model. The limitations of this paper might be due the method used for processing data, a restricted number of studies and use of one data base. Consequently, future studies might conduct a content analysis for a relevant publication on this specific theme of integration of sustainability into excellence models in public sector. Furthermore, the researcher might extend the analysis on other databases like Scopus, SpringerLink, ProQuest, Emerald Insight, etc.

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