

Public procurement research: a bibliometric analysis

Public
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research

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Received 24 August 2022
Revised 6 January 2023
2 August 2023
2 December 2023
Accepted 4 December 2023

Abstract

Purpose – The literature on public procurement (PP) has increased significantly in recent years, and, to date, several reviews have been conducted to study this relevant subject. Nevertheless, a bibliometric analysis of the PP knowledge domain is still missing. To fill this knowledge gap, a bibliometric review is carried out to investigate the current state of PP research.

Design/methodology/approach – A total of 640 journal articles are selected from the Scopus database for the final analysis. The performance indicators of the literature are identified and explained through bibliometric analysis. Furthermore, the conceptual and intellectual structures are studied through a keyword co-occurrence network and bibliographic coupling.

Findings – The results of the review indicate that PP research has increased significantly in recent years. The top ten most productive journals, countries, authors and academic institutions are identified. The findings from the keyword co-occurrence network reveal six main research themes including innovation, corruption and green public procurement (GPP). By applying bibliographic coupling, the focus of PP research revolves around seven thematic areas: GPP, corruption, the role of small and medium-sized enterprises (SMEs) in PP, electronic PP, innovation, labour standards and service acquisition. The research potential of each thematic area is evaluated using a model based on maturity and recent attention (RA).

Originality/value – To the best of the authors' knowledge, this is the first study to successfully organise, synthesise and quantitatively analyse the development of the PP domain amongst a large number of publications on a large time scale.

Keywords Public procurement, Sustainability, Corruption, Innovation, Bibliometric

Paper type Literature review

1. Introduction

Conceptually, public procurement (PP) is defined as the “*acquisition of products and services needed for public organisations to fulfill their functional objectives*” (Kristensen *et al.*, 2021, p. 1). PP can be used to influence industry, the economy and overall society, supporting the implementation of government policy (Connell, 2009; Harland *et al.*, 2019). Furthermore, PP can act as a vehicle for ensuring better social conditions (Uenk and Telgen, 2019) and addressing broader sustainability issues (Bratt *et al.*, 2013; Gelderman *et al.*, 2017; Montalbán-Domingo *et al.*, 2018).

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The literature on PP has increased substantially in recent years, with several reviews being made to study this relevant topic. For example, [Raymond \(2008\)](#) conducted a literature review to investigate the main principles of PP and how they can be benchmarked. It is found that reform alternatives for PP processes must address concerns of transparency, accountability, value for money, a professional workforce and ethics. [Cheng et al. \(2018\)](#) review the literature pertaining to green public procurement (GPP), considering English-language articles between 2000 and 2016. According to the authors, the literature mainly focusses on the specific impacts of GPP adoption, whereas the discussion on GPP relative to other environmental policy tools in terms of efficiency and innovation is overlooked. In the same vein, [Sönichsen and Clement \(2020\)](#) make a detailed review of early publications on sustainable and green procurement from 2000. The study demonstrates how awareness and understanding of circular PP features, based on the implementation of a circular policy and strategy, are crucial for realising circular PP. [Burghardt and Pashkevich \(2021\)](#) review the essential elements of GPP and uncertainties in the context of road marking materials, including plastic masses, paints and tapes. Finally, [Hamilton \(2021\)](#) explores the grey and academic literature to evaluate the evolving landscape of PP policy and supply chain regulation in high-income nations. The findings of the study indicate that leading countries are embracing a required approach to sustainable PP and due diligence laws are transforming supply chains from reputational harm to legal responsibility. In addition, the themes related to technological innovation and green production dominate the literature on sustainable PP, whilst themes associated with social sustainability, poverty, inequality and human rights continue to be underrepresented.

Whilst existing studies undeniably offer scholars a treasure trove of information and perspectives, a comprehensive bibliometric study of the PP field remains notably absent. This is unexpected, given the recent trend of employing bibliometric methods to examine a variety of scientific areas. The value of such studies extends beyond what academic databases (e.g. Scopus) provide, as it helps to capture the essence and progression of the field in a more holistic manner ([Fahimnia et al., 2015](#); [Rejeb et al., 2022a](#)). [Ferreira et al. \(2014\)](#) emphasises the need for scholars to frequently introspect the knowledge generated, to identify research trends, comprehend the breadth of topics covered, methodologies and theories employed and discern the body of knowledge, intellectual structure and potential areas for future exploration. Bibliometric studies can provide a rigorous, quantitative and structured analysis of publications that offer such introspection and surpass the capabilities of databases like Scopus ([Donthu et al., 2021](#)). Previous reviews on PP, whilst valuable, are prone to various biases due to their dependence on researchers' judgements and a limited collection of publications ([Cheng et al., 2018](#); [Raymond, 2008](#)). Traditional reviews often struggle to efficiently organise, summarise and quantitatively evaluate the evolution of PP research over extended periods and across a vast number of articles. As an interdisciplinary subject spanning multiple disciplines, PP adds to the complexity ([Nzimakwe and Biyela, 2021](#)). In contrast, a bibliometric analysis can provide an objective, unbiased and timely examination of the scholarly progress and intellectual structure of the PP field ([Rejeb et al., 2022b](#)). It allows for the identification of key performance indicators and research themes, revealing core thematic research areas and suggesting possible future directions. More specifically, in this study, we attempt to answer the following research questions:

- (1) What are the key bibliometric indicators (e.g. the annual trend of publications, the most productive journals, nations, authors and institutions, the seminal publications and the most frequent keywords) in the PP field?
- (2) What is the intellectual structure of PP research?

To the best of our knowledge, no previous study has comprehensively explored the entire PP field, considering its publication characteristics and scientific community. The understanding of such publication patterns can direct future research and help uncover research trends and gaps. This review seeks to bring attention to the leading journals and researchers that are pivotal in shaping the future of this knowledge domain. Through citation analysis, we can discern the current hotspots and trends in the scientific field (Gao *et al.*, 2022). The geographic dispersion of PP-related publications can also be mapped out through bibliometrics, illuminating research progress and development across nations and institutions (Lei *et al.*, 2019). Identifying major thematic areas in the PP literature using bibliometric methods is another benefit that databases like Scopus do not easily afford. This study provides significant contributions to both researchers and practitioners. For researchers, it brings to light research trends, aiding the preparation for future PP studies and identifying gaps to refocus future research efforts. It can also facilitate the formation of global research collaborations and initiatives. For practitioners, including organisations, institutions, investors and policymakers, the research offers insights into the themes that have been central to PP research, thereby enabling informed decision-making. In conclusion, this study is more than just an incremental contribution to the existing body of research. It serves as a vital, comprehensive examination of the PP field via bibliometric analysis. The unique insights gained from this study yield valuable information that extends beyond what can be gleaned from conventional database resources.

The remainder of the article is organised as follows. The research method is explained in Section 2. The descriptive analysis is discussed in Section 3, which is followed by the findings of bibliographic coupling in Section 4. A detailed discussion is given in Section 5. Finally, Section 6 concludes the paper and highlights the implications and limitations of the study.

2. Research method

To achieve the objectives of this work, we conduct a bibliometric analysis to investigate PP research (Donthu *et al.*, 2021; Fusco and Ricci, 2018). Furthermore, we use the open-source computer programme VOSviewer (Eck and Waltman, 2009) to organise the pertinent literature based on bibliographic coupling. Unlike other bibliometric software (e.g. Sci2, CiteSpace), VOSviewer excels in usability and visualisation capability (van Eck and Waltman, 2014; Pizzi *et al.*, 2021), enabling to visualise items based on a distance-based mapping approach (Eck and Waltman, 2009). Considering the systematic literature review (SLR) types proposed by Paul and Criado (2020), we determine that our study fits with the method-based review type. Typically, this type of SLR seeks to summarise and extend a corpus of literature by applying a quantitative or qualitative method. In this review, VOSviewer is used to construct the keyword co-occurrence network and perform bibliographic coupling. The former aims to form clusters that provide a wider perspective of various research focusses within a certain academic field (Rejeb *et al.*, 2020). The latter seeks to measure the similarity between two articles based on a number of common references (Maseda *et al.*, 2022).

Following the guidelines by Seuring and Gold (2012) for performing an SLR, conducting high-quality research and guaranteeing the reliability and validity of the content analysis, we applied a two-step approach. The first step was to locate and identify all potentially relevant documents. The authors identified the related keywords, formulated the search query, consulted the database and discussed the publication's delimitation criteria. The search query for Scopus was devised with insights from Cheng *et al.* (2018). The search targeted the title, abstract and keywords fields using the following string: "public procurement" OR "public purchas*" OR "government procurement" OR "government purchas*". This combination was chosen to ensure an optimal balance between capturing a broad scope of

relevant articles and minimising the inclusion of unrelated publications. Whilst the breadth of the PP field does span multiple disciplines (Nzimakwe and Biyela, 2021), this study focusses primarily on articles categorised under “business, management, and accounting” for several reasons. Firstly, concentrating on this area ensured a more detailed and focussed investigation of the complex PP landscape, enhancing the precision of the study’s findings (Goodall *et al.*, 2014). It also improved the ability to systematise and generalise the data (Filimonau and Krivcova, 2017). Moreover, it is important to clarify that the categorisation system used by Scopus does not strictly segregate articles into singular categories. Many articles are cross-indexed under multiple categories, ensuring interdisciplinary research is still captured. For instance, a paper discussing the economic aspects of PP may be indexed under both “economics” and “business, management, and accounting”. Thus, the multidisciplinary nature of the PP field was respected within the defined parameters.

The full search query deployed in the study is available for review in [Appendix 1](#). This reflects a commitment to transparency and aids in understanding the process that was followed for this bibliometric analysis. The present approach ensured the relevance and conciseness of the review, whilst still accommodating the PP field’s inherent interdisciplinary nature. This approach strikes a balance between breadth and specificity, ensuring the analysis remains rigorous and focussed, whilst still capturing the diverse landscape of PP research.

Scopus is a popular tool in bibliometric research since it facilitates the retrieval of scholarly articles from the Internet using a textual search query (Ligorio *et al.*, 2022). Similarly, Scopus is widely used by academics to acquire high-quality analyses, and it also includes many user-friendly features that streamline the implementation of bibliometrics (Gorraiz and Schloegl, 2008). As a service of Elsevier, Scopus is comparatively more thorough than PubMed and Web of Science. Whereas the Web of Science indexes 54% of Scopus documents, only 36% of Web of Science documents are indexed in Scopus (Garrido-Cardenas *et al.*, 2020). Scopus’s stronger control over cited documents and regulated indexing make it more accurate than Google Scholar (Dinić and Jevremov, 2021). Whilst a number of scientific databases and freely available online sources can be used in bibliometric analyses, the overwhelming majority of technology-focussed studies consulted one database (Suominen and Seppänen, 2014) because VOSviewer and other similar bibliometric software can only read data from one database and cannot process or integrate data from multiple databases (Yeung *et al.*, 2019). Therefore, we chose Scopus for the analysis with guidance from several prominent bibliometric studies (Fahimnia *et al.*, 2015; Mishra *et al.*, 2017; Sweileh, 2018).

Only English-language journal articles and reviews are included in the study. The search was conducted on May 29, 2022, yielding 977 publications. Although the year 2022 had not yet concluded, we chose to include its findings in our analysis to present the most recent trends in the literature, thereby ensuring the relevancy and timeliness of our analysis. Following this, two members of our team reviewed the titles and abstracts of the articles for their pertinence to the study. When an abstract did not provide sufficient information for a determination, the complete article was scrutinised. Articles were excluded from the analysis if they were missing crucial bibliometric details such as abstracts or keywords. Consequently, 334 papers were omitted as they had no direct relevance to the research topic. Meanwhile, an additional 3 papers were disregarded due to the absence of necessary bibliometric information. The final analysis included a total of 640 journal articles. These articles were clustered and evaluated on the basis of a bibliographic coupling network created using VOSviewer. All the authors of this work took part in the definition of the clusters and the identification of their prevailing theme, thereby ensuring reliability and construct validity (Seuring and Gold, 2012). The research process in this review is depicted in [Figure 1](#).

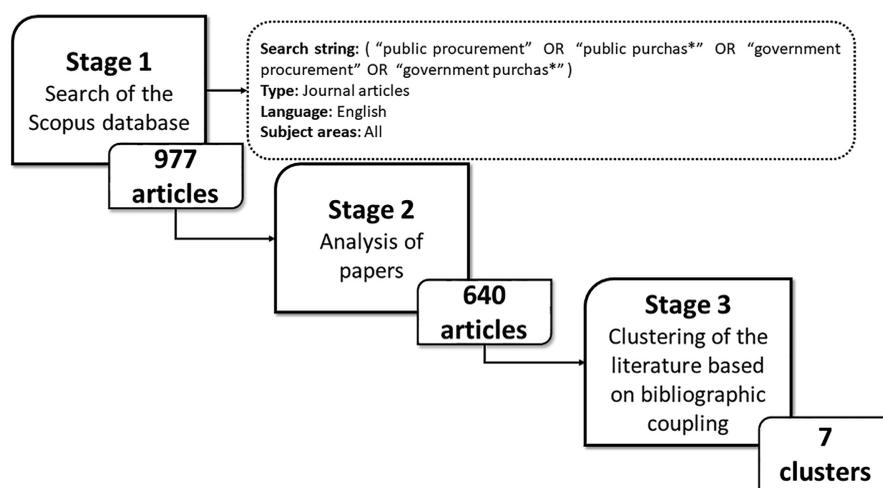


Figure 1.
The review process

Source(s): Author’s own creation/work

3. Descriptive results

Regarding the annual distribution of articles, we can observe from [Figure 2](#) that few articles are found each year until 2008, indicating that the PP concept was an emerging topic. From 2009, the number of articles increases significantly, emphasising the substantial interest of scholars in PP ([Ambe, 2019](#)). The last decade can be termed the growth stage of PP research. According to [Cutcher et al. \(2020\)](#), PP is seen as a crucial mechanism of new public governance due to the engagement of non-government players in accomplishing policy objectives. Therefore, it is expected that the number of articles will increase in the upcoming years.

[Table 1](#) presents the top ten most productive journals in the PP field. Overall, these journals published 226 articles representing 35.31% of the 640 articles selected. The *International Journal of Procurement Management* tops the list with 49 articles,

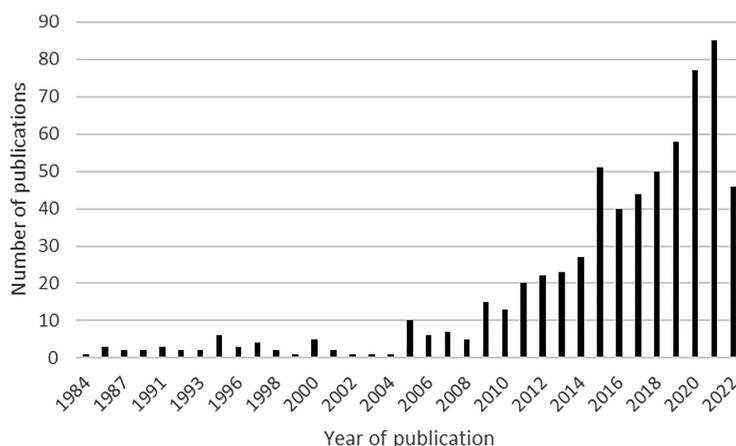


Figure 2.
Distribution of PP research by year

Source(s): Author’s own creation/work

Table 1.
Top ten most
productive journals

Journal	Number of publications
<i>International Journal of Procurement Management</i>	49
<i>Journal of Cleaner Production</i>	43
<i>Journal of Purchasing And Supply Management</i>	37
<i>Public Money and Management</i>	23
<i>International Journal of Public Administration</i>	20
<i>Innovation: The European Journal of Social Science Research</i>	17
<i>Research Policy</i>	14
<i>International Journal of Construction Management</i>	9
<i>Engineering Construction and Architectural Management</i>	7
<i>International Journal of Industrial Organization</i>	7

followed closely by the *Journal of Cleaner of Production* with 43 articles. Next are the *Journal of Purchasing and Supply Management* with 37 articles, followed by *Public Money and Management* with 23 papers. The journals' distribution of articles suggests that PP research is published in journals that focus on procurement management, sustainability and public administration. Furthermore, the coverage of the most prolific journals encompasses other research areas and topics, such as innovation, policy and construction management. Therefore, the articles published in these outlets demonstrate the range, interdisciplinarity and depth of PP research.

In [Table 2](#), we list the top ten most productive countries (representing the affiliations of the contributing researchers). The highest number of papers are published by authors from the United Kingdom (104), followed by the United States of America (103) and Italy (53). This finding is consistent with [Walker and Brammer \(2012\)](#) who confirm the dominance of the UK in PP research. According to [Wontner et al. \(2020\)](#), PP accounts for a large chunk of expenditure, amounting to 13% of the UK's gross domestic product (GDP) in 2017 and one-third of all UK public expenditure. [Elder and Georghiou \(2007\)](#) also state that the country has the most sophisticated and methodical approach of PP, including the UK Government Innovation's Report of 2003, which advocated a variety of initiatives to increase the research and innovation effect of PP. In the United States of America, PP plays a critical role in the development of innovations like the Internet, semiconductors and large passenger aeroplanes ([Sirotkina and Pavlovskaya, 2018](#)). Similarly, the country has launched a programme of affirmative action for SME procurement since 1978 to make access to government procurement easier for small enterprises, with a fair share of PP spending to be going to small and other disadvantaged firms ([Georghiou et al., 2014](#)). Overall, the country-wise distribution

Table 2.
Top 10 most
productive nations

Country	Number of publications
The United Kingdom	104
The United States of America	103
Italy	53
Sweden	36
Finland	29
Germany	28
Russian Federation	28
The Netherlands	27
Australia	26
Spain	21

of articles demonstrates that tremendous research progress in the PP field has been made by scholars from developed countries.

Table 3 displays the top 10 scholars who have published the most papers in the PP field. Yakovlev, A. tops the list with eight papers, followed by Basheka, B.C. and Walker, H. with seven papers and Davis, P. and Tkachenko, A. with six papers. These results show that the discipline has not yet matured as only a few researchers dominate the PP domain. It is worth mentioning that a substantial number of these papers were co-authored by Yakovlev, A. and Tkachenko, A. These researchers examined the PP system in Russia from the perspective of corruption (Detkova *et al.*, 2018), opportunism (Yakovlev *et al.*, 2020), costs (Balaeva and Yakovlev, 2017) and organisational forms and incentives (Tkachenko *et al.*, 2018).

The top ten most productive institutions in the PP field are listed in Table 4. The University of Manchester and HSE University (Russia) have published the highest number of articles, followed by Florida Atlantic University and The World Bank with eleven papers each. In general, a small number of institutions from developing nations appear on the list of the most productive institutions.

Table 5 lists the top ten publications according to the number of citations received in the Scopus database. Edler and Georghiou (2007) have the highest number of citations amongst all publications (534), followed by the articles from Brammer and Walker (2011) with 333 citations. These two studies are highly influential as they quickly diffused across the PP community, setting the theoretical groundwork for the relationship between PP, innovation and sustainability. In their study, Edler and Georghiou (2007) examine PP as one of the essential components of a demand-driven innovation policy. Walker and Brammer (2009) held the third position in the ranking, with a total of 299 citations in the Scopus database. This

Author	Number of publications
Yakovlev, A.	8
Basheka, B.C.	7
Walker, H.	7
Davis, P.	6
Tkachenko, A.	6
Essig, M.	5
Glas, A.H.	5
McCue, C.P.	5
Rodionova, Y.	5
Tátraí, T.	5

Table 3.
Top 10 most
productive authors

Institution	Number of publications
The University of Manchester	16
HSE University	16
Florida Atlantic University	11
The World Bank	11
Alliance Manchester Business School	10
Kwame Nkrumah University of Science and Technology	10
Norges Teknisk-Naturvitenskapelige Universitet	9
Università degli Studi di Padova	8
Universität der Bundeswehr München	8
University of Birmingham	8

Table 4.
Top 10 most
productive institutions

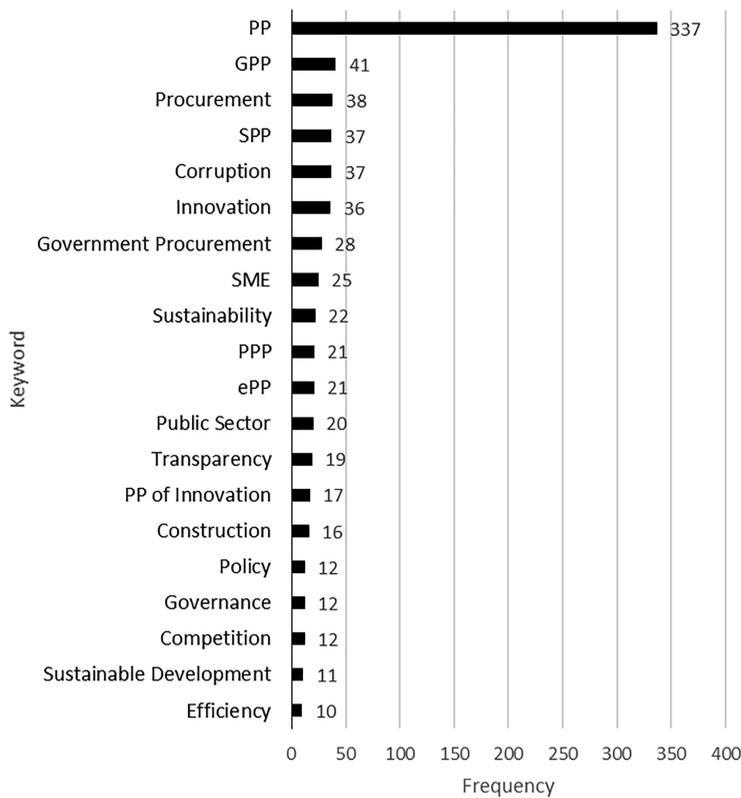
Table 5.
Top 10 most influential
publications

Article	Title	Number of citations
Edler and Georghiou (2007)	Public procurement and innovation-Resurrecting the demand side	534
Brammer and Walker (2011)	Sustainable procurement in the public sector: An international comparative study	333
Walker and Brammer (2009)	Sustainable procurement in the United Kingdom public sector	299
Edquist and Zabala-Iturriagoitia (2012)	Public procurement for Innovation as mission-oriented innovation policy	229
Aschhoff and Sofka (2009)	Innovation on demand-Can public procurement drive market success of innovations?	201
Preuss (2009)	Addressing sustainable development through public procurement: The case of local government	192
Uyarra <i>et al.</i> (2014)	Barriers to innovation through public procurement: A supplier perspective	165
Walker and Brammer (2012)	The relationship between sustainable procurement and e-procurement in the public sector	161
Georghiou <i>et al.</i> (2014)	Policy instruments for public procurement of innovation: Choice, design and assessment	161
Cheng <i>et al.</i> (2018)	Green public procurement, missing concepts and future trends – A critical review	140

study explores sustainable procurement in the UK public sector and reveals that there is substantial heterogeneity in the nature of sustainable procurement practices amongst public sector entities. The study by [Edquist and Zabala-Iturriagoitia \(2012\)](#) received 229 citations and the article by [Aschhoff and Sofka \(2009\)](#) received 201 citations. A closer look at these studies and at others in the table shows that sustainability, innovation and e-procurement are mainstream in the PP field.

[Figure 3](#) illustrates the top 20 most prevalent keywords in the sample set. The figure indicates that public procurement (PP) is the most frequent keyword, which is expected given that it was used in the search query. The second most frequent keyword is GPP. According to [Malatinec \(2019\)](#), GPP represents a mechanism intended to facilitate the attainment of environmental objectives via green purchasing. Sustainable public procurement (SPP) ranks as the fourth most frequent keyword. Unlike GPP that emphasises environmental procurement, SPP prioritises social and economic dimensions of sustainability ([Cheng *et al.*, 2018](#)). The keywords “corruption”, “innovation” and “SME” are frequently used in PP research. Specifically, corruption is described as the use of public power to achieve private gains ([Sharma *et al.*, 2019](#)). Corruption can take several forms, such as theft, bribery, embezzlement and favouritism, placing private interests ahead of public ones, exploiting conflicts, abuse of discretion and inappropriate political contributions ([Neupane *et al.*, 2014](#)). As a result, the adoption of sound PP performance measurements is imperative to reduce corruption practices ([Tutu *et al.*, 2019](#)). To summarise, the list of the most frequent keywords demonstrates the topical richness of PP research.

Authors’ keywords can provide the reader with the core content of articles and their analysis can assist researchers in identifying new research trends and topical knowledge areas in a scientific domain ([Zhu and Hua, 2017](#)). In this review, a keyword co-occurrence network with 94 nodes is constructed. [Figure 4](#) depicts the generation of six different clusters as a result of setting the minimum keyword frequency in the network to four. Keywords are accompanied with the number of the cluster to which they belong. It is obvious from the network that *Cluster 1* is the most important. This cluster focusses on the link between PP



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Figure 3.
Top 20 most frequent
authors' keywords

Source(s): Author's own creation/work

and innovation. Related keywords in this cluster include innovation, public-private partnerships (PPP), public procurement of innovation (PPI) and innovation policy. *Cluster 2* concentrates on corruption in PP and the solution to curb this issue. *Cluster 3* revolves around green and sustainable PP. *Cluster 4* contains twelve keywords and it essentially concerns the role of small and medium-sized enterprises (SMEs) in PP. *Cluster 5* is on sustainability in construction PP. Related keywords in this cluster include sustainability, construction, governance, etc. *Cluster 6* is labelled as public administration and policy, referring to the involvement of procurement specialists in policy formulation (Roman, 2017). Appendix 2 provides the full list of the keywords appearing in the keyword co-occurrence network.

4. Findings of the bibliographic coupling

Grouping publications that cover related topics is a crucial step in identifying new research directions. If two publications in a citation network link to (cite or are referenced by) the same publication, it is likely that the publications handle the same topic. Therefore, publications that tackle the same themes constitute a tightly knitted cluster in a citation network (Lee et al., 2018). Using VOSviewer, we conducted a bibliographic coupling of the selected articles to discover the most prominent research topics in the PP field. The process of this method sets

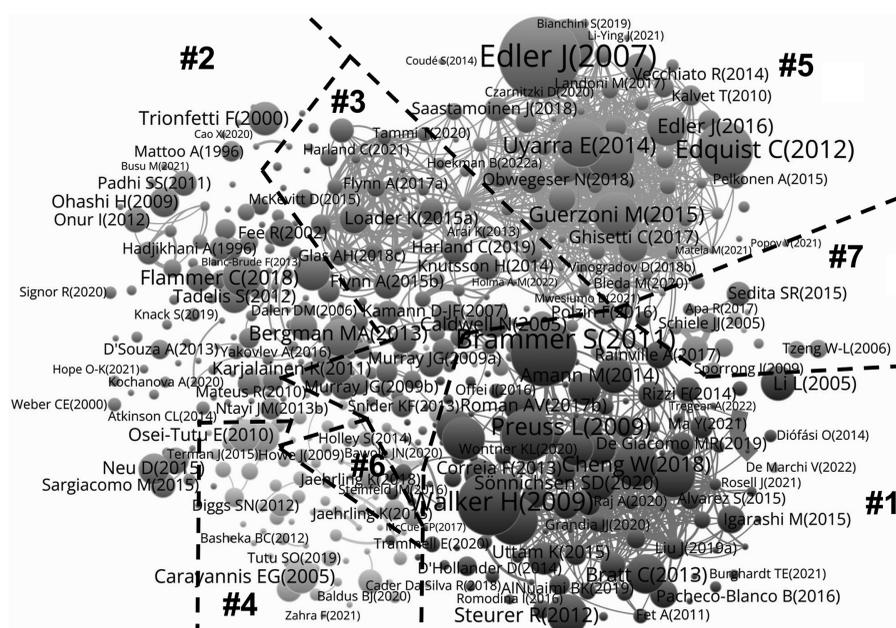


Figure 5. Bibliographic coupling network

Source(s): Author's own creation/work

No. of cluster	Main theme	Exemplary studies
1	Green public procurement (GPP)	Cheng <i>et al.</i> (2018), De Giacomo <i>et al.</i> (2019), Grandia <i>et al.</i> (2015), Igarashi <i>et al.</i> (2015), Krieger and Zipperer (2022), Lindström <i>et al.</i> (2022), Liu <i>et al.</i> (2019a), Liu <i>et al.</i> (2019b)
2	Corruption and PP	Blanc-Brude (2013), Busu and Busu (2021), Chiappinelli (2020), D'Alpaos <i>et al.</i> (2013), Detkova <i>et al.</i> (2018), Estache and Iimi (2010), Gallego <i>et al.</i> (2021), Gani (2017)
3	The role of SMEs in PP	Ancarani <i>et al.</i> (2019), Fayos <i>et al.</i> (2022), Flynn (2017), Flynn <i>et al.</i> (2015), Flynn and Davis (2016, 2017), García <i>et al.</i> (2018), Glas and Eßig (2018)
4	Electronic PP	Aboelazm (2022), Afolabi <i>et al.</i> (2022), Al-Aama (2012), Dlakuseni <i>et al.</i> (2018), Fleming <i>et al.</i> (2010), Haim Faridian (2015), Lee (2019)
5	Innovation and PP	Amann and Essig (2015), Bleda and Chicot (2020), Caloghirou <i>et al.</i> (2016), Ghisetti (2017), Lember <i>et al.</i> (2015), Lenderink <i>et al.</i> (2022), Saastamoinen <i>et al.</i> (2018)
6	Labour standards	Benjamin (2020), Holley (2014), Holley <i>et al.</i> (2015), Howe and Landau (2009), Jaehrling <i>et al.</i> (2018), Sack and Sarter (2018)
7	Service acquisition	Crowder (2015), Moe <i>et al.</i> (2017), Nazari <i>et al.</i> (2017), Schiele (2005, 2007), Schiele and McCue (2006, 2010)

Table 6. Main research themes in each cluster

procurement officials' knowledge and create a novel conceptual model to investigate the elements that may influence the GPP performance of Chinese procurement officials. Based on the data gathered from 139 Chinese local government officials, the research concludes that procurement officials' knowledge of GPP implementation policies has a direct and favourable

effect on their GPP performance. Overall, the articles in this cluster focus on the role of GPP in promoting sustainable products and enhancing environmental performance. Additional in-depth research is required to further examine how GPP can contribute to sustainable development goals in developing countries (Zaidi *et al.*, 2019). Researchers should study the condition of GPP in many nations and its factors outside the contracting unit (Rosell, 2021). Furthermore, there is a need to develop broad guidelines for the implementation of GPP by conducting case studies of GPP in diverse contexts (Aldenius and Khan, 2017). Additional research could be undertaken on circular PP and its contribution to sustainability at the organisational and local levels (Kristensen *et al.*, 2021; Ntsondé and Aggeri, 2021; Rosell, 2021; Sönnichsen and Clement, 2020).

4.1.2 Corruption in PP. The second cluster contains 114 articles and mainly focusses on the relationship between corruption and PP. In this regard, Chiappinelli (2020) introduces a new theoretical framework for explaining the prevalence of corruption in PP. The results indicate that a benevolent politician can deter the contracting firm from padding costs by selecting an auditing procedure that is sufficiently stringent; conversely, a selfish politician chooses an auditing procedure that is relatively lax to encourage cost-padding and engages in corruption with the enterprise in the event of detection. Detkova *et al.* (2018) assess the influence of corruption on the motivations of procurers to maintain fair competition in tenders. Based on a huge dataset of open auctions held by regional-level Russian authorities, the study demonstrates that in more corrupt areas, agencies fail to organise competitive bids and the majority of auctions have just one bidder. Thus, the centralisation of procurement can minimise customer corruption, but it cannot address the issue of low competition. Clark *et al.* (2018) examine the effect of an investigation into collusion and corruption to understand the organisations of cartels in PP auctions. Gauthier *et al.* (2021) find that corruption is a supply-side phenomenon in PP, with firms often initiating bribery transactions to gain public contracts. Finally, Ntayi *et al.* (2013) explore the connection between corruption and moral schemas in PP and recommend that managers should be involved in morally responsible behaviours to support ethics and reduce corruption. Overall, we remark that most of the articles in cluster 2 focus on the causes and solutions for reducing corruption in PP. Future research may go further by analysing in depth how corruption can be seen as a normal or inevitable aspect of PP (Pilonato, 2022). Moreover, additional research could help to determine the anti-corruption elements of perceived benefits of digitalisation in lessening corruption in public government (Neupane *et al.*, 2014). Ultimately, there is a need to develop early warning systems at the level of contractors to anticipate the risks of corruption in government procurement (Gallego *et al.*, 2021).

4.1.3 The role of small and medium-sized enterprises (SMEs) in PP. The third cluster consists of 89 articles, which mainly discuss the role of SMEs in PP. The most influential study in this cluster is written by Karjalainen and Kemppainen (2008), who examine the type of resources and characteristics that impact SME participation in PP. According to the authors, a lack of perceived resources, particularly legal competence and administration, discourage SME involvement in PP. Similarly, Flynn *et al.* (2015) find that firm size, in terms of employee numbers, significantly impacts SME tendering resources, behaviour and success. Accordingly, micro-enterprises are resource-constrained, tender less frequently and have lower success rates than SMEs. The barriers to SME involvement in PP have been the subject of study for several years; nevertheless, the predictors of SME performance have received less attention. To address this lacuna, Flynn and Davis (2017) analyse the role of tendering relational and procedural capabilities in determining SME involvement and success in PP competitions. SMEs have to invest in tendering capabilities and devise buyer involvement strategies. In a nutshell, the studies in the third cluster discuss the factors that determine the success or failure of SMEs in PP. Accordingly, more research should be devoted to understanding how SMEs can leverage their capabilities and resources to

formulate self-help strategies to enhance participation in PP (Akenroye *et al.*, 2020). Such insights will help clarify the necessary firm-level capabilities for SME involvement in PP activities. More empirical studies are needed to analyse the barriers to SME involvement in PP in developing countries (Akenroye and Aju, 2013; Karjalainen and Kempainen, 2008). Finally, the role of PP in supporting the competitiveness of SMEs should be further studied (Glas and Eßig, 2018).

4.1.4 Electronic PP. The fourth cluster contains 83 articles in which the main focus is on electronic PP. For example, Carayannis and Popescu (2005) investigate and assess the European Commission's electronic procurement programmes to get a better understanding of how the use of modern information technology facilitates the implementation of an efficient PP strategy. When applied to PP, information technology enables a more transparent PP market and efficient information sharing between purchasers and suppliers. Costa *et al.* (2013) explore the public e-procurement deployment and underline its primary obstacles and effects according to the type of public organisation. The findings reveal that the administrative level of the entities impacts the implementation of e-procurement, which is impacted by the innovation adoption process. Tutu *et al.* (2019) evaluate the important criteria for e-procurement implementation in Ghana using data collected from 60 procurement professionals. When it comes to the adoption of e-procurement, the findings reveal that power stability, Internet access, capacity enhancement of procurement officers, and the presence of infrastructure are crucial factors, whereas the mandatory usage of e-procurement, technical interoperability and budgetary control are less significant factors. E-procurement is also proven as a potential solution to eliminate corruption and ensure proper accountability of public funds. As a result, possible future research directions in this cluster include gaining knowledge of how e-procurement can successfully operationalise certain aspects of sustainable PP (Walker and Brammer, 2012). Researchers should seek to develop user-friendly and efficient e-procurement systems so that procurement professionals do not sense the need to bypass the new, formal and automated procurement processes (Basheka *et al.*, 2012). More attention should be paid to studying the critical success factors for public e-procurement in developing countries to guide the policymakers and stakeholders in e-procurement deployment (Tutu *et al.*, 2019).

4.1.5 Innovation and PP. The fifth cluster comprises 73 articles that mainly focus on the role of PP in stimulating innovation. The most influential article in this cluster is the seminal work published by Edler and Georghiou (2007). The authors explain PP as a fundamental element of demand-driven innovation policy. Similarly, Aschhoff and Sofka (2009) integrate PP into the broader framework of public policies to foster innovation including regulations, research and development subsidies and university-based research. The results of their study indicate that PP and university knowledge contribute to innovation success. Uyarra *et al.* (2014) attempt to understand how impediments associated with processes, competencies, processes and relationships in PP impact suppliers' capacity to innovate and realise the advantage of innovation. The primary barriers stated by suppliers include a lack of connection with procuring enterprises, the use of over-specified bids, limited procurement competencies and inadequate risk management throughout the procurement process. Seeking to offer empirical evidence on this point, Caloghirou *et al.* (2016) investigate a pilot pioneer e-Government project at the level of local authorities and argue that PP for innovation aims to solve the difficulty of delivering value-added e-Government services to residents and companies whilst simultaneously establishing a more effective management of resources and organisational activities as well as considerable economies of scale. To advance research in this cluster, scholars should examine how innovation-oriented PP impacts purchasing performance from the demand and supply side (Matela and Hallikas, 2021). Future studies may explore how PP stakeholders can approach and influence innovation ecosystems to succeed with their business process innovation (Stokke *et al.*, 2022). Finally, the impact of

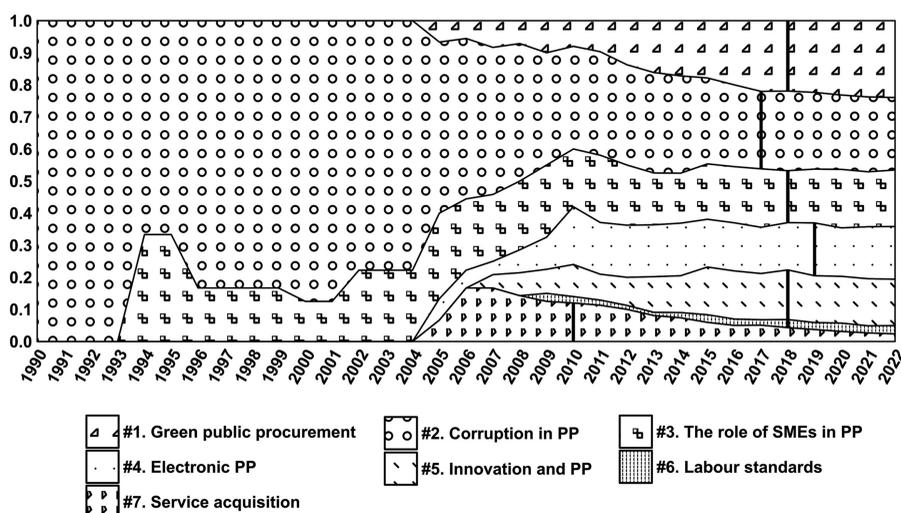
innovation culture values and practices on the economic, social and environmental performance of PP is an intriguing research question that still needs to be answered.

4.1.6 Labour standards. The sixth cluster contains a total of 13 articles, which mainly concentrate on labour standards in PP contracts. In this regard, [Sack and Sarter \(2018\)](#) study several forms of labour clauses in PP law that have been implemented in Germany. The research corroborates findings regarding the major role of left parties campaigning for labour clauses in PP. [Holley et al. \(2015\)](#) explore the effectiveness of labour-protective clauses in New South Wales government contracts between 2010 and 2011 and conclude that the inclusion of these provisions in Australian procurement contracts is superfluous and any assumption that government contracting agencies would monitor and enforce labour standards is deceptive. [Martin-Ortega \(2018\)](#) explore the innovative use of PP as an instrument to respect, defend and promote labour rights by leveraging on the substantial power of public procurers over business supply chain practices. Through an evaluation of the electronic watch model, it is claimed that by combining the economic power of public procurers with corporate human rights due diligence, it is possible to develop revolutionary instruments for the betterment of labour conditions in global supply chains. Future research may explore how PP policies can impact different labour forces, improve job quality and enhance workplace diversity ([Benjamin, 2020](#)). Besides, further studies can investigate the potential of PP to improve labour standards ([Ravenswood and Kaine, 2015](#)) and regulate corporate labour practices ([Howe and Landau, 2009](#)). Researchers can also conduct empirical studies to evaluate the labour intensity of the procurement process and other elements of the PP system ([Balaeva et al., 2022](#)).

4.1.7 Service acquisition. The final cluster consists of 12 articles, which mainly relate to service acquisition in PP. For example, [Schiele and McCue \(2006\)](#) aim to obtain a better understanding of the circumstances under which municipal purchasing departments can be actively engaged in the procurement of consulting services using a case-based methodology. According to the authors, the barriers to effectively involving the procurement department are complex and diverse, particularly in relation to tough purchase decisions such as those pertaining to consulting services acquired by the public sector. [Sporrong \(2011\)](#) examine current buying processes within the context of competing needs and find a strong emphasis on price or more readily quantified non-price variables. Besides, [Sporrong and Bröchner \(2009\)](#) investigate how Swedish Municipal customers' selection processes for architectural and engineering consultants create incentives for environmentally friendly design management. It is reported that over half of municipalities have a general policy for services procurement, whereas these policies are not always adhered to when acquiring construction-related services. Related to the topic of this cluster, researchers should demonstrate how the procurement department can streamline the acquisition process of services, avoid delays and pitfalls and increase the transparency of the process ([Schiele, 2005](#)). Studies on the role of PPP in stimulating innovative solutions within public infrastructure and service acquisitions are welcome ([Torvinen and Ulkuniemi, 2016](#)). The development of new purchasing-related capabilities, specifications and competitive processes in public sector organisations should be studied in the future.

4.2 Research potential evaluation

In this section, we present the research potential evaluation (RPE) model to assist researchers in assessing the research potential of the various subfields identified from the bibliographic coupling in the PP knowledge domain. [Figure 6](#) shows the results of determining the relative fraction and half-life of the yearly number of articles of each cluster. In this figure, the size of the ribbon for a particular year represents the proportion of the overall literature on PP allocated to the cluster for that year. For example, in 2003, there was no band for the themes of



Source(s): Author's own creation/work

Figure 6.
The proportion of each cluster in PP research

electronic PP and innovation, indicating that no scholarly papers were published in those subfields during that year. In the figure, the solid black lines are used to illustrate the start of the half-life of articles for each cluster. The concept of half-life was initially employed to describe the index of a journal (Bernal, 1958). This analysis is broadened to include the timeline after the solid black line, which corresponds to the appearance of the latter half of the cluster's scholarly output. When the solid black line shifts more to the right, it indicates that the majority of the literature in the cluster has been published during recent years and that the pace of development of academic production has increased considerably. Accordingly, the solid black lines for the seven clusters tend towards the right since most of the articles have been published in the later phase of the sample period. Before 1993, Cluster 2 (corruption in PP) was in a dominant position, contributing to the formation of PP research. Afterwards, novel research themes, represented by Cluster 3 (the role of SMEs in PP), Cluster 1 (GPP), Cluster 4 (innovation and PP) and Cluster 7 (service acquisition), appeared and swallowed up the portion of Cluster 2's share. So far, the research clusters have stayed almost the same, although their evolutions have been vastly different. The theme of corruption has the longest history and is dominant in terms of publications, particularly at the outset, giving it a long publication half-life. Whilst the role of SMEs in PP is also a considerable theme in terms of size, the vast majority of its publications have occurred during the past decade, giving it a short publication half-life. Cluster 1 (GPP), 4 (electronic PP) and 7 (service acquisition) came into a common tier based on their starting time. However, there is a significant difference between these clusters. Unlike Cluster 2, which is the largest in terms of articles published ($n = 121$), Cluster 7 has the least number of publications ($n = 12$) and the longest publication half-life (approx. 12 years), contributing limited literature to the PP field over the past few years. Finally, Cluster 5 (innovation and PP) and Cluster 6 (labour standards) have the shortest history (approx. 16 and 14 years) and a relatively short publication half-life (4 years), attracting a considerable volume of literature in recent years.

Besides the analysis of the clusters based on the number of publications and half-life, it is necessary to accurately assess the worth of the clusters and foresee future hot trends. Consequently, it is vital to adopt a research potential model and utilise data on the number of

publications, citations and half-life to precisely evaluate the various clusters of PP research and provide a useful reference and source of inspiration for scholars in the PP field.

The importance-performance analysis (IPA), a well-known approach in quality control, serves as the basis for the proposed model for assessing research potential (Martilla and James, 1977). Along a two-dimensional matrix established by importance and performance, IPA classifies quality aspects as low priority, possible overkill, keep up the good work and concentrate here. Whilst many factors, such as the number of publications, the frequency with which they are cited, publication density, and the duration of the research field, are all relevant to determining research potential, the two indicators of maturity and recent attention (RA) cover most of the essential ones. The maturity level of a research field can be determined by examining the percentage of highly cited articles compared to the total number of publications in that area. As such, this ratio offers insights into the extent to which the work in a field is regarded as authoritative. Following is the formula for determining the maturity:

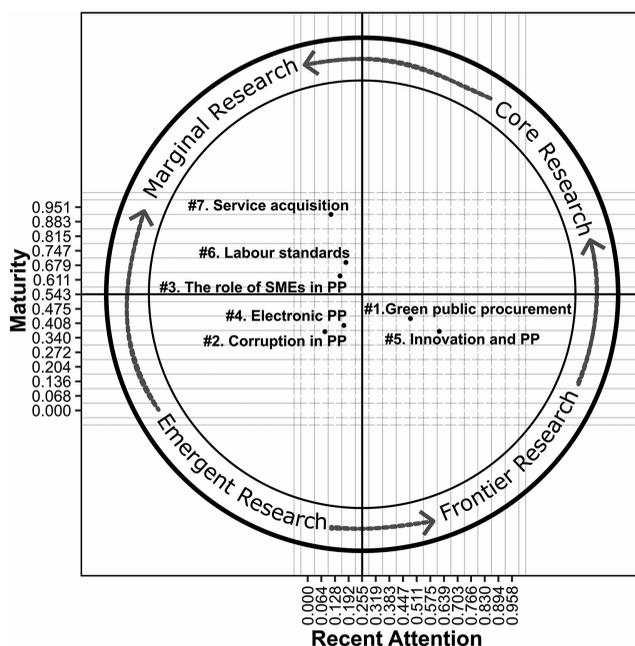
$$\text{Maturity} = \frac{\text{number of highly cited papers}}{\text{total number of papers}}$$

Lotka's law states that the threshold for a highly cited publication is $N = 0.749 \sqrt{N_{\max}}$, where N_{\max} represents the number of citations of the most commonly cited work in this subject (Allison *et al.*, 1976). High-impact publications have a score higher than N . The range of maturity is zero to one. In this study, we argue that all else being equal, research potential grows in tandem with decreasing topic maturity. To propose promising directions for future research, the following formula for RA is applied:

$$\text{RA} = \frac{\text{TC}}{\text{TP}} \times \frac{1}{\text{D}} \times \frac{1}{\text{R}}$$

where TC = total citations, TP = total publications, D = total number of years and R = recency. If the half-life is shorter, then the recency is greater. The literature on a topic is said to be "heating up" if the amount of publications on the topic is rising quickly, indicating that the field is ripe for development. Using the recency criterion, we can forecast the level of interest in a field and its future trajectory. Scholars are giving more attention to a subject with a higher RA, which bodes well for the prospects of fast development in that field. Similar to the IPA, the RPE model is a four-quadrant matrix that classifies research fields into categories according to their average level of maturity and RA. "Frontier Research", "Core Research", "Emergent Research" and "Marginal research" are the four categories shown in Figure 7.

The "Frontier Research" are the research areas exhibiting high RA but low maturity. These fields are gaining scholarly attention and are potential future hotspots, yet have been less explored and thus less accomplished over the years. Their high RA and low maturity markers present immense opportunities for exploration, discovery and publication, signifying an enticing prospect for researchers looking to pioneer new ground. The "Core Research", on the other hand, embodies the established and conventional areas of research. These fields maintain high RA and high maturity, signifying that they not only consistently attract attention but also have a rich foundation of existing research. The "Emergent Research" category refers to the fields with low RA and low maturity. These are either emerging areas yet to attract wide interest or older fields that have lost their shine. Lastly, the "Marginal Research" section comprises fields with low RA but high maturity. These are fields with early beginnings and notable contributions, yet, because they have been so thoroughly explored and their popularity has waned, it is challenging for researchers to make groundbreaking strides. Data relevant to this study are derived from the results of bibliographic coupling and are shown numerically in Table 7.



Source(s): Author’s own creation/work

Figure 7. Prediction of the research potential of each cluster in the PP field

Cluster	TC/TP	D	R	NH	RA	M
#1	32.760	17	4	52	0.482	0.430
#2	12.912	32	5	42	0.081	0.368
#3	16.989	28	4	56	0.152	0.629
#4	8.639	17	3	33	0.169	0.398
#5	37.014	15	4	27	0.617	0.370
#6	9.308	13	4	9	0.179	0.692
#7	17.000	13	12	11	0.109	0.917

Note(s): TC: total citations; TP: total publications; D: duration; R: recency; NH: number of highly cited papers; RA: recent attention and M: maturity

Table 7. Indicators of the seven clusters in PP research

Figure 7 depicts the breakdown of the RPE model of the seven identified clusters. The quadrants of “Frontier Research” and “Emergent Research” contain two clusters each, whilst the “Marginal Research” quadrant has three clusters. The research clusters pertaining to GPP and innovation within PP are currently situated within the “Frontier Research” quadrant. This does not contradict the fact that GPP is a major subtopic within the field (Cheng *et al.*, 2018). Despite its recognised significance, GPP may still be classified as a “Frontier Research” due to the existence of substantial research gaps or an observed surge in scholarly attention, thus explaining its elevated RA. Moreover, this categorisation reflects the substantial potential for further in-depth exploration within the GPP sphere. Even though GPP has been under the scholarly spotlight for a considerable duration, myriad aspects remain underexplored, offering ample opportunity for groundbreaking research and novel

contributions to the field. This implies that there seems to be a great deal of interest in the potential implementation of greening practices in PP in fostering economic, environmental and social sustainability, even if such a policy has not been substantially investigated so far (Cheng *et al.*, 2018). Therefore, topics associated with GPP have the highest potential for further studies. For example, the utility of applying circular economy practices in PP has received less attention in the scholarly community. Public sector procurement and bidding processes are only starting to adapt to the circular economy principles (Sönnichsen and Clement, 2020). As a result, future research needs to illuminate how circular PP and GPP can be a substantial incentive for not just ecological and environmental innovation but also for addressing the current lack of support for innovation by the public and private sectors (Ntsondé and Aggeri, 2021). As PP is not a distinct activity restricted to the procurement department, there is a need to study the complexity of PP operations when moving from GPP to circular PP (Rejeb and Appolloni, 2022). There is still some debate in the academic community on the impact of these tools on promoting sustainable innovation and green market development. Studies have demonstrated, however, that it may be difficult for local authorities to foster public sector innovation via circular PP. For instance, Aldenius and Khan (2017) highlight the difficulties faced by local governments that seek to encourage innovation in certain technologies but lack detailed definitions of the necessary functional needs. Some researchers even claimed that GPP and circular PP do not achieve their objective of creating more environmentally friendly marketplace (Lundberg *et al.*, 2015). The literature is also silent on how GPP can motivate public parties to increase their consumption of sustainable products and services and encourage private actors to alter their production methods (Cheng *et al.*, 2018; Neto and Gama Caldas, 2018). As a result, there is a lack of literature on the potential impact of GPP on markets and innovation (Cheng *et al.*, 2018). Furthermore, future studies should investigate how the deployment of GPP can affect stakeholder involvement and supply chain structure and impose new responsibilities on diverse players in the public sector. In addition, further research is required to examine the process of integrating circular economy practices into PP, the obstacles to circular PP adoption and the collaborative strategies required for the success of GPP and circular PP.

Whilst the two clusters can be described as “Frontier Research”, the more recent focus on innovation is higher than GPP, which indicates a greater accumulation of remarkable accomplishments, more engagement and higher research potential for this cluster. The “Frontier Research” topics are moving closer to “Core Research” status as more and more highly referenced works of literature are being published on the subject. We anticipate that the cluster of GPP will advance more rapidly into the “Core Research” quadrant than its counterpart, innovation and PP, since its literature growth rate is higher. “Core Research” themes represent strong pillars of PP research and are characterised by substantial RA. In the “Emergent Research” quadrant, the clusters have low RA and maturity, indicating either emerging but unpopular topics or established but overlooked areas of study. This quadrant contains two clusters: electronic PP and corruption in PP. Although the concept of electronic PP constitutes one of the most crucial and prioritised areas of e-government (Lindskog, 2008), little is known about the critical success factors of implementing electronic PP to improve the performance of public institutions (Tutu *et al.*, 2019). There is also a need to explore how social media can be leveraged to boost e-procurement in the public sector (As-Saber *et al.*, 2014). The cluster of electronic PP has more potential to become a “Frontier Research” topic than corruption. Although most public organisations have a number of safeguards in place to ensure the proper management of public funds, PP seems to be particularly vulnerable to corruption (Gottschalk and Smith, 2016). In the future, researchers should analyse the role of ethics in preventing corruption and enrich the PP literature that has investigated the processes that form the PP professional body (Sargiacomo *et al.*, 2015). Whilst there is a growing dependence on private enterprises in PP, the current scholarly literature provides

less information on the ethical implications of PP's growing reliance on private enterprises (Hawkins *et al.*, 2011). Despite the fact that the demand side (the government) of corruption has received a lot of attention, less emphasis has been paid to corruption from the supply standpoint (Sikka and Lehman, 2015). Therefore, future research should focus on establishing effective procedures to reduce corruption, increase PP transparency and enable the detection of possible opportunism and fraud (Afolabi *et al.*, 2022). Overall, the clusters in the "Emergent Research" quadrant have seen little progress, and there is a dearth of recent literature. However, the future of the clusters is characterised by uncertainty and variety, as the shift to one of the three quadrants is conceivable.

Three clusters are located in the "Marginal Research" quadrant, namely, Cluster 3 (the role of SMEs in PP), Cluster 6 (labour standards) and Cluster 7 (service acquisition). In general, this quadrant is filled with mature topics that have received little attention recently. The clusters currently located in the "Marginal Research" quadrant find it challenging to move to other quadrants. The role of SMEs in PP has been a frontrunner in the beginning but has since seen a continuous fall in attention. Whilst several academic studies have elaborated on the significance of SMEs in PP (Flynn *et al.*, 2015; Glas and Eßig, 2018; Karjalainen and Kempainen, 2008), the influence of SME participation in international purchasing has gotten limited attention from researchers (Namagembe *et al.*, 2021). To be successful in today's business climate, SMEs must find ways to overcome the constraints that limit their productivity and contracting opportunities. As a result, it is important to take a closer look at the tools SMEs need to improve their involvement and engagement in PP projects (Akenroye *et al.*, 2020). The impact of regulations and policies on SMEs' involvement in PP should be investigated in future research. As SMEs are often considered more innovative and dynamic than large firms, PP accommodating SMEs can thus inspire new business ventures and stimulate creativity (Nicholas and Fruhmann, 2014). Further, academics need to evaluate the merits of SMEs as PP suppliers and the difficulties they confront in meeting the demands of public sector players (Karjalainen and Kempainen, 2008). Labour standards and service acquisition represent unfashionable research topics with a very limited scope, and their high level of maturity is mostly attributable to the small number of published works. Unlike the role of SMEs in PP, labour standards and service acquisition may eventually be abandoned due to the lack of interest in the topics. In addition, these two clusters have a greater level of maturity whilst receiving less RA; thus, their research potential is limited.

5. Discussion

Since PP is a growing trend in the academic debate, this study aims to apply bibliometric techniques to examine the current intellectual structure of PP research. Results show that the number of articles in this field has increased enormously in the last decade. Each of these articles contributes a piece of the puzzle and offers an increased understanding of PP research. The analysis of the keyword co-occurrence network shows six research clusters of innovation, corruption, GPP, construction PP and public administration and policy.

This study investigates the realm of PP, unveiling seven key thematic clusters. As opposed to a mere summary of each theme, this critical review takes the reader on a scholarly journey that identifies not only the unique characteristics of each theme but also their future research potential and corresponding maturity levels. By integrating the research directions into the cluster analysis, we provide a more cohesive and comprehensive examination, echoing the call for more integrated research in the field. Starting with GPP, the first cluster, we notice that existing literature primarily focusses on the theoretical and policy-driven aspects of GPP (Cheng *et al.*, 2018; Sönnichsen and Clement, 2020). Our contribution lies in the critique of this approach and our push for research that focusses on practical implementation and the societal transformation required for effective GPP. By viewing GPP

in this lens, we see potential intersections with other themes, such as electronic PP, which can facilitate GPP implementation and corruption prevention, which can help ensure the integrity of GPP processes.

Moving to the second cluster, corruption, it is evident that whilst many studies have discussed this issue (Detkova *et al.*, 2018; Sharma *et al.*, 2019), a gap remains. This cluster's research often treats corruption as an individual phenomenon, neglecting its systemic nature (Lyandau and Umnova, 2021). We argue that corruption should be studied as a symptom of larger institutional failures and socio-economic factors. This approach brings us to intriguing intersections with other clusters such as the role of SMEs and electronic PP. Could electronic PP help alleviate corruption? Or could the institutional barriers faced by SMEs contribute to corruption?

Furthermore, SMEs traditionally garner attention due to the challenges they face within PP (Akenroye and Aju, 2013; Loader, 2015). This study suggests a novel view that uncovers their transformative potential. Intriguingly, intersections emerge between SMEs, electronic PP and innovation, paving the way for SMEs to leverage electronic PP as a tool to stimulate innovation within the procurement landscape. The fourth cluster, electronic PP, is often lauded for its operational benefits. However, this study advocates for a more critical examination, particularly to address issues like digital exclusion and the potential emergence of new forms of corruption (Jiménez *et al.*, 2022). These considerations create an intricate web of connections, linking electronic PP with clusters such as SMEs, corruption prevention and, potentially, innovation and service acquisition. These links provide fertile ground for future research, which can further improve our understanding of these intersections.

On the topic of innovation, a strong focus is usually placed on strategic procurement policies. In contrast, this study suggests shifting the focus towards a bottom-up approach, exploring the latent potential for innovation within day-to-day operations (Edler and Georghiou, 2007). This perspective places innovation at the centre of the conversation with other clusters, such as electronic PP and SMEs, highlighting their interconnected roles in fostering innovative practices. As the sixth cluster, labour standards emphasise the ethical side of PP. However, they often overlook the broader issues of labour exploitation and inequality within supply chains. Our review of this thematic category may reveal its intersections with other clusters such as GPP and service acquisition. It is thus worth considering a more robust application of GPP principles or service acquisition strategies to mitigate labour exploitation.

Finally, service acquisition stands out as an under-researched area ripe for critical and empirical examination. Our exploration of this cluster highlights potential intersections with electronic PP, innovation and GPP. These intersections hint at the untapped potential to harness technology and innovate or green procurement practices in improving service acquisition, thus creating new avenues for research and practical application. Overall, these clusters reflect the complexity and multi-dimensionality of the PP field. It is clear that no single approach or perspective can fully encapsulate the intricacies of PP. Future research, therefore, should not only continue to explore these diverse facets but also strive to understand the interconnections between them, thereby creating a more coherent and comprehensive narrative in the field of PP.

Reflecting on the results of the RPE model, we assess the evolution of PP themes, anchored in the theoretical framework of Telgen *et al.*'s (2007) seven-stage PP maturity model. Notably, the transformation of PP research over time uncannily mirrors the progression outlined in Telgen *et al.*'s (2007) model. This parallel alignment reveals fascinating insights into the development and maturation of PP literature. Initially, the most prominent theme in the field was corruption, which represents a theme that resonates with the first two levels of Telgen *et al.*'s (2007) model. These levels are primarily focussed on the fundamental delivery of goods and services and compliance with legislation and regulations, respectively. The attention to

corruption essentially underscores the crucial importance of integrity and transparency in procurement processes, especially in their foundational stages (Detkova *et al.*, 2018; Osei-Tutu *et al.*, 2010). Subsequent stages in the model introduce more complex dimensions, such as efficient use of public funds, accountability and value for money. We observe an intriguing alignment here with the emergence and prominence of the themes of electronic PP and innovation in the PP literature. These themes represent a shift towards optimising procurement processes through technology and creative problem-solving (Jiménez *et al.*, 2022), capturing the essence of efficiency and value for money in the procurement realm.

The maturation continues towards broader policy objectives, and we find PP literature echoing this with the advent of themes like GPP. These themes reflect a concern for broader societal and environmental issues and exemplify the progression towards the advanced stages of PP maturity, where procurement processes are harnessed to support and deliver wider government objectives (Grandia and Meehan, 2017). The least researched theme, service acquisition, corresponds to a more recent and advanced level of PP maturity, indicating that only limited literature has delved into this complex subject so far. This could be due to the fact that this topic, like SPP, requires a highly advanced level of maturity, as suggested by Telgen *et al.* (2007). What is striking from this analysis is the dynamic and evolving nature of the PP field. The shift in research focus from corruption to more complex issues such as innovation and green procurement indicates the progression of the field. It also suggests the readiness and capacity of the PP domain to respond and adapt to societal changes, policy revisions, technological innovations and shifting business practices (Grandia and Meehan, 2017). Therefore, this exploration underscores the importance of continuous growth and advancement in PP maturity, as it not only allows for broader policy objectives to be achieved but also shapes the research focus and direction in the field of PP. The comprehension of this phenomenon offers valuable insights for both academia and practitioners, fostering a better understanding of the intricate landscape of PP.

6. Conclusions, research implications and limitations

This review aims to provide a SLR of PP research by conducting a bibliometric analysis of 640 peer-reviewed articles from Scopus. As a result, the performance of PP research is analysed to gain a deeper understanding of the annual distribution of publications, the most prominent journals, the most productive countries and academic institutions and the most impactful studies. Furthermore, keyword occurrence analysis, keyword co-occurrence network analysis and bibliographic coupling are carried out to uncover the conceptual and intellectual structure of PP research. The study also applies the RPE model to examine the prospective future and development patterns of each identified research cluster. As the first of its kind, this study not only offers a systematic summary of PP research from many perspectives but also classifies its major lines of inquiry and current hot subjects. In addition, using a new research approach that integrates bibliographic coupling with content analysis, seven research clusters are identified, and last, their defining features and essential contents are elucidated. Finally, the RPE model is used to assess each cluster's potential in light of its current state of development and the level of attention it has received recently, thus shedding light on hot issues and promising avenues for research.

This study provides practitioners and academics with several insights and implications. The article presents a comprehensive bibliometric analysis that helps to identify, structure, enclose and explore critical elements of the subject and highlights the necessity for further research. Being objective, the current study reports the research performance outcomes pertaining to PP based on the most contributors (journals, authors, countries and academic institutions) and pertinent themes. The study contributes to the existing PP literature and its historical development and raises practitioners' knowledge of the main themes covered in this

field. The study findings are helpful for researchers in obtaining an increased understanding of the global research undertaken on PP and how it is distributed across academic journals, scholars, countries and academic institutions. Moreover, it assists academics in gaining an understanding of the origins, evolution and current situation of the PP field, as well as revealing the most significant trends and identifying the potential research directions.

This study has a few shortcomings despite its major contributions. The search terms used to extract the material are based on the original body of literature. As a result, any new set of keywords may yield different insights that enrich the domain's emerging trends. Additionally, focussing primarily on publications categorised under business, management and accounting may have impacted the findings. This aspect should be acknowledged as a limitation, reflecting the potential effects of this focus on the scope and interpretation of the study's results. Furthermore, searching only the Scopus database could have influenced the findings to some extent. Thus, future research can expand this study by selecting additional academic databases. This analysis reveals that the thematic structure of the field is evolving and covering several topics. Given this evolution, the impact of our focus on a particular subject field warrants consideration to provide a more comprehensive understanding of how this choice might have shaped our findings. Therefore, future research may refute or confirm the results of this study by conducting a comparable investigation using other clustering techniques such as co-citation analysis. Researchers from various disciplines should contribute to PP research from a multidisciplinary perspective.

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Appendix 1

TITLE-ABS-KEY (“public procurement” OR “public purchas*” OR “government procurement” OR “government purchas*”) AND (LIMIT-TO (SRCTYPE, “j”)) AND (LIMIT-TO (DOCTYPE, “ar”) OR LIMIT-TO (DOCTYPE, “re”)) AND (LIMIT-TO (SUBJAREA, “BUSI”)) AND (LIMIT-TO (LANGUAGE, “English”))

Source(s): Authors’ own creation/work

Appendix 2

Cluster 1	Cluster 2	Cluster 3
PP (public procurement) Innovation	Procurement Corruption	GPP (green public procurement) SPP (sustainable public procurement) Sustainable Development
PPP (public-private partnership) PP of innovation	Government Procurement ePP (electronic public procurement)	Ghana
Competition Policy China Healthcare Innovation policy Decision-making Developing countries Outsourcing Auctions Public service Supplier selection Agency theory Auction theory Bidding Brazil Czech Republic Implementation Institution Public transport Risk Strategic procurement Transaction cost economics	Transparency Efficiency Accountability Contracting Uganda EU (European Union) e-Government Effectiveness Internal Control Municipality Value for Money Case Study Centralisation Contract Management Procurement Management Procurement Process Russia SCM (supply chain management) Service Delivery	Local Government Compliance PP Law Purchasing Government Policy Consultants CSR (corporate social responsibility) Ecolabel/ling Public Management Sweden Tender Procurement Policy Public Sector Organisations
Cluster 4	Cluster 5	Cluster 6
SME (small and medium-sized enterprises) Public sector Supplier COVID-19 Tendering Capability Contract Transaction costs Government contracting Negotiation Procurer Small business	Sustainability Construction Governance Project Management Regulation Infrastructure Content Analysis Government SC (supply chain) UK	Public Administration Public Policy Performance Benchmarking Risk Management Gender

Table A1.
Lists of all keywords
based on the keyword
co-occurrence network

Source(s): Authors’ own creation/work