

BIBLIOMETRICS USING VOSVIEWER WITH PUBLISH OR PERISH: MAPPING RESEARCH ON AUDIT QUALITY

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Abstract

This study aims to analyze the development trends, key themes, and collaboration patterns in audit quality research from 2020 to 2024 using bibliometric methods. By utilizing data from Google Scholar collected through the Publish or Perish software and analyzed using VOSviewer, the research maps out keyword co-occurrence, co-authorship networks, and research focus shifts over time. The findings reveal that “audit quality” and “auditor” are the dominant terms consistently discussed in the literature, particularly linked to variables such as independence, competence, professionalism, and integrity. The overlay visualization highlights a shift from institutional factors to individual auditor characteristics, indicating a growing interest in behavioral and ethical aspects of audit quality. Meanwhile, the density visualization shows a concentration of research around central topics, with less-explored areas such as auditor ethics and integrity offering potential for further investigation. The study provides theoretical insights into the structure of audit quality research and practical implications for improving auditor competence and ethical standards. However, it is limited by the use of a single data source and lack of content-level analysis. Future studies are encouraged to expand data sources and explore emerging themes such as digital audit tools and technological integration.

Keywords: audit quality, audit, bibliometric analysis, publish or perish, VOSviewer.

INTRODUCTION

Audit plays a very important role in maintaining the integrity and reliability of financial statements, which are the main basis for economic decision making by various parties, including investors, regulators, and the general public. In the midst of globalization and rapid digital transformation, the issue of corporate accountability is getting serious attention, along with the increasing risk of financial scandals. In this context, audit quality is a strategic factor to strengthen public trust in the economic system. A number of studies confirm that high quality audits directly contribute to reducing financial statement manipulation and increasing capital market efficiency (Fallatah *et al.*, 2021).

In the past two decades, the academic literature on audit quality has grown rapidly and dynamically. Various aspects have been studied, ranging from the influence of auditor independence, audit rotation, the application of international financial reporting standards (IFRS), to its relationship with corporate sustainability practices (Bao *et al.*, 2020). However, the high growth rate of publications has resulted in mapping the knowledge structure becoming increasingly complex and difficult to do manually. Therefore, bibliometric analysis is an important approach to identify research trends, categorize key themes, and understand the development of scientific collaboration in the field of audit quality studies (Aburیشه *et al.*, 2023).

As an academic data source, Google Scholar provides a wider range of publications than databases such as Scopus or Web of Science. Google Scholar includes not only scientific journals, but also conference proceedings, theses, dissertations, and preprints from various disciplines. Using

Google Scholar in bibliometric research provides an opportunity to obtain a more inclusive picture of research, including from developing countries that are often underrepresented in paid databases (Najaf *et al.*, 2022). In processing and visualizing such complex data, software such as VOSviewer is widely used. VOSviewer allows users to map relationships between topics, identify patterns of collaboration between researchers, and conduct co-citation analysis with intuitive and informative graphical presentations (A Marisa *et al.*, 2024).

Previous studies that mapped audit quality literature generally focused on commercial databases with coverage of certain indexed journals. Studies such as those by (Azzari *et al.*, 2020) and (Chi *et al.*, 2024) have highlighted the importance of open data-based analysis such as Google Scholar, but studies specifically exploring the mapping of audit quality literature using this platform are limited. In addition, the mapping of scientific collaboration through co-authorship analysis in audit quality studies has also not been widely studied, which opens up research space to better understand the dynamics of global academic networks in this field.

Based on this background, this study aims to analyze research development trends, main themes, and patterns of scientific collaboration in audit quality studies by utilizing data from Google Scholar and analyzed using VOS Viewer. This research is expected to make theoretical contributions to the development of studies in accounting and auditing, as well as generate practical implications that are useful for auditors, academics, and policy makers in an effort to improve audit quality in the future.

LITERATURE REVIEW

Stakeholder Theory

Stakeholder theory is an important conceptual framework used to understand the relationship between an organization and the various parties involved or affected by its activities, including investors, customers, employees, suppliers, local communities, and governments. According to Freeman *et al.* (2010), this theory emphasizes that organizational success is not only determined by the interests of shareholders, but also by the organization's ability to create shared value for all relevant stakeholders. the application of stakeholder theory is very relevant to map audit quality as a product of the interaction of various actors, including auditors, clients, regulators, and the public. This is in line with the idea that audit quality is not just a technical issue, but also about meeting the expectations and needs of various parties with direct and indirect interests.

Audit Quality

Audit quality is defined by DeAngelo (1981) as the probability that the auditor will be able to find and report material errors in the client's financial statements. This definition emphasizes two main dimensions: the auditor's technical competence in detecting irregularities and the auditor's independence in communicating the findings to relevant parties.

Several factors that affect audit quality include auditor independence, professional competence, and the use of information technology in the audit process. Auditor independence is the main foundation in maintaining the objectivity of the opinions produced (Mustika *et al.*, 2024). Meanwhile, professional competence is closely related to the educational background, work experience, and ongoing training received by the auditor, which directly affects the acumen in finding discrepancies in the financial statements.

Along with the times, technological advances, including the application of data analytics and big data-based audits, are increasingly important in supporting the effectiveness and efficiency of the audit process (Pangaribuan, 2024). This integration of auditor competence, independence, and technological sophistication forms the basis for the creation of high-quality audits, which ultimately strengthens public confidence in financial statements and supports the stability of the global financial system.

Differences in Research Approaches Compared to Previous Studies

This research has significant differences compared to previous studies such as those conducted by Aburishah *et al* (2023), Antwi *et al* (2023), and A Mustika *et al* (2024). The majority of previous studies focused on analyzing data obtained from paid databases such as Scopus or Web of Science. Although these two databases are recognized for their credibility, their coverage tends to be limited as they do not fully represent publications from developing countries or non-mainstream literature (Chi *et al.*, 2024; Najaf *et al.*, 2022). In contrast to these approaches, this study offers a more inclusive perspective by utilizing Google Scholar as the main data source, allowing for a broader mapping of research including journals, proceedings, books, and preprints that are not indexed in commercial databases. In addition, if previous studies generally only rely on one analysis tool such as VOSviewer, this research combines it with Publish or Perish (PoP) to obtain more detailed and structured bibliometric metric data (Harzing, 2021). Thus, this study not only expands the scope of data sources, but also strengthens the methodological approach through the integration of two bibliometric analysis tools that have rarely been used together in previous studies.

Bibliometric Analysis

Bibliometric analysis is a quantitative approach used to map and understand the dynamics of scientific literature through measuring and visualizing relationships between documents, authors, institutions, and keywords (Najaf *et al.*, 2022). This analysis includes several main methods, namely:

- a. Citation analysis: Counts the number of citations a document or author receives to assess its impact on the development of the field.
- b. Co-citation analysis: Assesses how often two documents are cited together in other literature, reflecting the intellectual relatedness between the works.
- c. Bibliographic coupling: Connects documents that share similar references, indicating a common research focus.
- d. Co-word analysis: Evaluates the co-occurrence of keywords in articles to reveal thematic structure and dominant research topics.

The application of bibliometric analysis provides strategic benefits in identifying recent research trends, discovering major thematic clusters, revealing collaborative relationships, and understanding the direction of development of a scientific field (Aburishah *et al.*, 2023). Thus, bibliometrics is an important approach in building an objective and systematic knowledge map.

Publish or Perish (PoP) and VOSviewer in Bibliometrics

Publish or Perish (PoP) is software designed to collect and manage bibliometric data from various data sources, including Google Scholar, Scopus, and Web of Science (Harzing, 2021). With PoP, researchers can automatically obtain important metrics such as citation count, h-index, g-index, and other relevant metrics, making it easier to evaluate the scientific impact of a work or the academic profile of an author.

Once the data has been collected, further analysis is conducted using VOSviewer software. VOSviewer provides various analysis and visualization features, including:

- a. Co-authorship mapping: Shows collaboration networks between authors or institutions.
- b. Co-citation mapping: Identifies documents or authors that are frequently co-cited in other publications.
- c. Bibliographic coupling: Connects articles that refer to the same source.
- d. Keyword co-occurrence: Analyzes the relationship between research themes based on keyword co-occurrence.

The main advantage of VOSviewer lies in its ability to process data on a large scale and produce interactive and intuitive visualization maps (Antwi *et al.*, 2023). These visualizations allow

researchers to easily identify knowledge structures, key actors, and emerging research themes in the analyzed field.

RESEARCH METHODS

This study uses a quantitative bibliometric design to analyze trends and scientific collaborations in studies on audit quality for the period 2020-2024. Data was collected from Google Scholar using Publish or Perish software with the keywords “kualitas audit” and “audit quality”, filtered by publication year. Publish or Perish (PoP) serves to collect metadata such as author name, article title, journal, year, and number of citations (Harzing, 2021). The bibliometric approach was chosen for its ability to quantitatively map the literature and identify the knowledge structure of a field (Najaf *et al.*, 2022). Once the data was collected, analysis was conducted using VOSviewer, which maps bibliometric relationships through co-authorship, co-citation, and keyword co-occurrence techniques. The resulting literature network visualization aims to reveal patterns of collaboration among authors, linkages among frequently co-cited literature, and dominant themes in audit quality research (Aburishah *et al.*, 2023). VOS Viewers was chosen for its ability to manage big data and generate interactive visual maps (Antwi *et al.*, 2023).

Table 1. Summary of Data Selection

Aspek	Kriteria
Data Source	Google Scholar
Time Range	2020-2024
Keywords	“Kualitas Audit”, “Audit Quality”
Document Type	Article
Extraction Process	Exported from PoP in RIS format
Sampel Size	500

RESULTS AND DISCUSSION

Development of Research Publications on Audit Quality

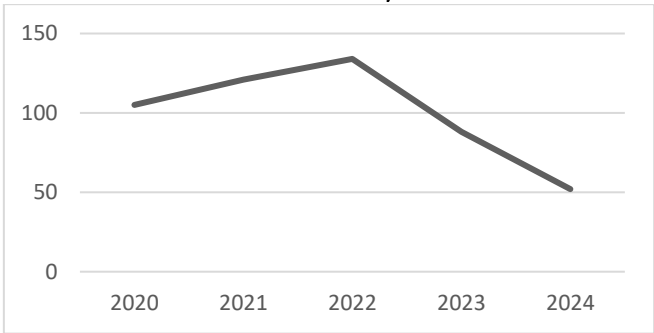


Figure 1. Graph of audit quality research progress

The results of the search for scientific publications related to Audit Quality from 2020 to 2024 on publish or perish (PoP) with a sample of 500 articles in the table and graph below show an increase and decrease in the number of publications from year to year. The growth trend started from 2020 with 105 documents (21%) and increased to 121 documents in 2021 (24%), then increased again in 2022 with 134 documents (27%), then began to experience a significant decline in 2023 to 88 documents (18%), and finally in 2024 also decreased to 52 documents (10%). This publication distribution indicates a lack of interest and attention from researchers on the topic of audit quality which is not in line with the number of cases related to audit quality produced by internal and external auditors.

Table 2. Development of audit quality research publications

Year	Document Total	Prosentase
2020	105	21%
2021	121	24%
2022	134	27%
2023	88	18%
2024	52	10%

Source: Data Processing Results, 2025

Most Active Authors in Audit Quality Article Publication

Selected	Author	Documents
☒	endiana, idm	3
☒	suryandari, nna	5
☒	arif, a	3
☒	budiantoro, h	4
☒	challen, ae	4
☒	kuntadi, c	11
☒	merawati, lk	3
☒	pangaribuan, h	4
☒	sari, r	6
☒	sukarmanto, e	3
☒	sunarsih, nm	4
☒	syofyan, e	3

Figure 2. List of authors in Audit Quality

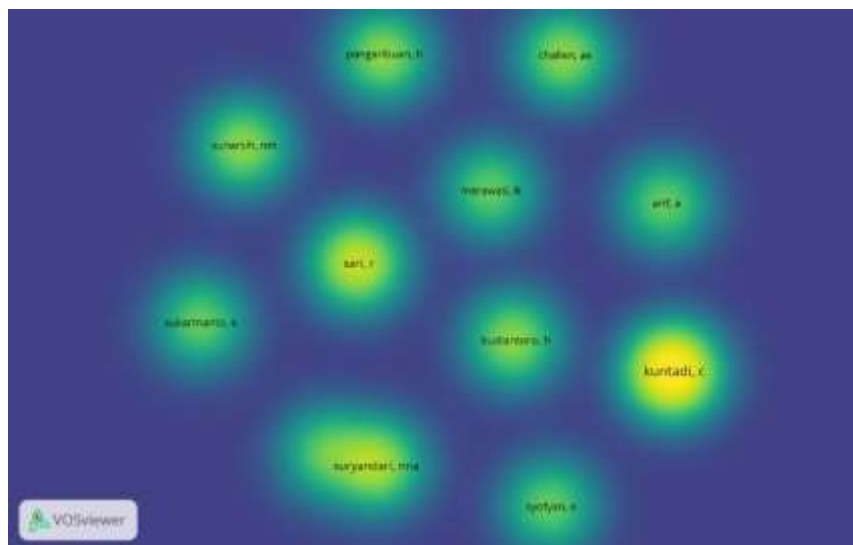


Figure 3. Density visualization based on co-authorship

Figure 2 and 3 displays the twelve (12) most productive and influential authors in audit quality research based on Google Scholar data. Kuntadi,c leads the way with 11 documents published. Sari,r follows with 6 documents. Suryandari has 5 documents and Budiantoro, Challen, Pangaribun, and Sunarsih have 4 documents each. Finally, Endiana, Arif, Merawati, Sukarmanto, and Syofyan have 3 documents each, and their publications reflect active collaboration in the field of audit quality.

Mapping the Development of Audit Quality Research Publications by Keyword

After the dataset is saved in RIS (Research Information Systems) format using metadata obtained through Publish or Perish, the next step is to analyze the dataset using the VOSviewer application through the “create a map based on text data” option, then choose data source select

“Read data reference manager files”, then upload the saved RIS data file, after that choose fields for “Title and abstract fields” and “Binary counting”. Based on Figure 1, the minimum number of occurrences of terms is five. Next, a list of terms that frequently appear in research related to “audit quality” will be displayed based on analysis using VOSviewer. This data includes a range of relevant terms that provide an overview of the research focus in this area. The relevance and frequency of occurrence of terms were calculated to determine the importance of each term in the research map. The visualization in Figure 4 illustrates the collaboration network as well as the interrelationships between the key concepts found in the analysis. The following are the results of the VOSviewer application:

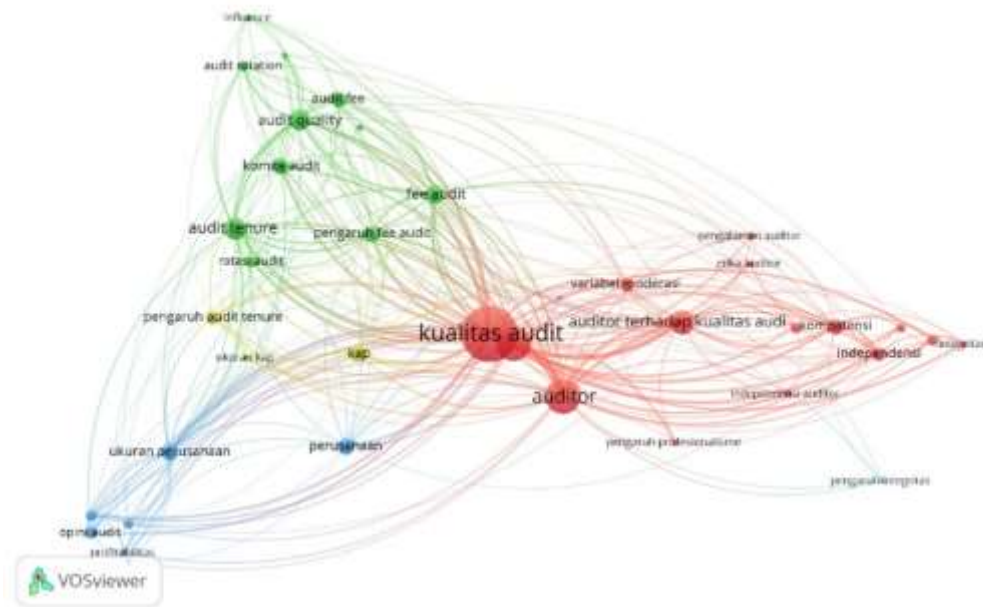


Figure 4. Network Visualization for Audit Quality

Based on Figure 4, which is the result of network visualization using the VOSviewer application, it can be seen that the terms “audit quality” and “auditor” are central in the research network with a larger node size and high linkage intensity to other terms. This indicates that these two terms are the main focus of related research on the topic of auditing, as well as being the central node connecting various variables such as “independence”, “competence”, “professionalism”, and “integrity”. The red network indicates a theme group that is closely related to auditor characteristics in influencing audit quality, while the green group emphasizes structural and organizational factors such as audit fees, audit tenure, and audit rotation.

Meanwhile, the blue group of nodes highlights contextual variables such as firm size and audit opinion that also contribute to shaping the understanding of audit quality. The interconnectedness of the colours in the visualization network suggests that these topics do not stand alone, but rather interact with each other and form a complex theoretical construct. This analysis indicates that the study of audit quality is multidimensional, encompassing aspects of individual auditors, institutional mechanisms, and the organizational environment. These visual findings can be used as a basis for developing conceptual frameworks or identifying further research gaps in empirical studies related to audit quality.

The Network Visualization in this study shows 6 distinct clusters:

- a. Cluster 1 consists of 15 items, which are specifically referred to as audit, auditor, auditor to audit quality, auditor ethics, independence, auditor independence, integrity, competence, audit quality, auditor experience, work experience, influence of

- independence, influence of professionalism, time budget pressure, and moderating variables.
- Cluster 2 consists of 7 items, which are specifically referred to as audit committee, audit fee, audit quality, audit rotation, audit tenure, audit fee, and influence.
 - Cluster 3 consists of 6 items, which are specifically called concern, leverage, audit opinion, company, profitability, and company size.
 - Cluster 4 consists of 3 items, which are specifically called KAP, audit tenure influence, and KAP size.
 - Cluster 5 consists of 1 item, which is specifically called audit fees.
 - Cluster 6 consists of 1 item, which is specifically called the influence of integrity.

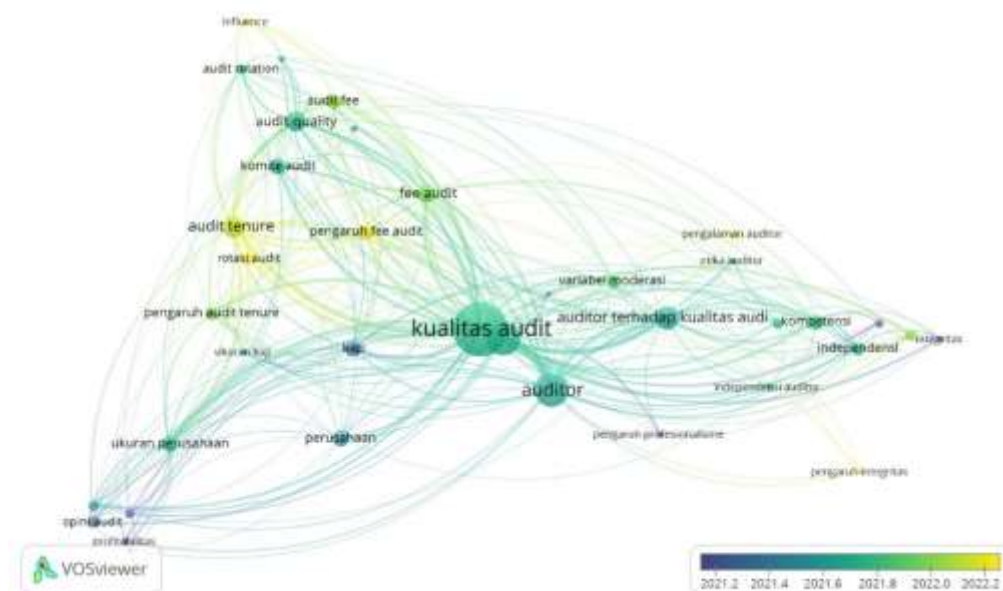


Figure 5. Overlay Visualization for Audit Quality

Figure 5 shows the results of overlay visualization using VOSviewer that provides a temporal overview of research trends on the topic of audit quality. The colors on the network reflect the publication time, where blue indicates older articles (around 2020-2021), while yellow represents more recent research (around 2022 and above). The “audit quality” and “auditor” nodes remain the center of attention in this visualization, indicating that these two topics have consistently been the main focus over various time spans. Some topics such as “audit opinion” and “company size” tend to be covered more in earlier studies, while terms such as “integrity effect” and “auditor experience” emerge as more recent themes.

The visualization also shows a shift in research focus away from the structural aspects of organizations and audit outcomes toward auditors' personal characteristics and psychological or behavioral factors. This is evident from the increased attention to terms such as “competence,” “professionalism,” and “integrity,” which are marked with brighter colors. This development reflects a paradigm shift in the study of audit quality, from focusing on institutional mechanisms to a more behavioral and ethics-oriented approach for individual auditors. Thus, the results of this overlay visualization can be used as a reference in formulating research directions that are relevant and contextual to the latest scientific dynamics.

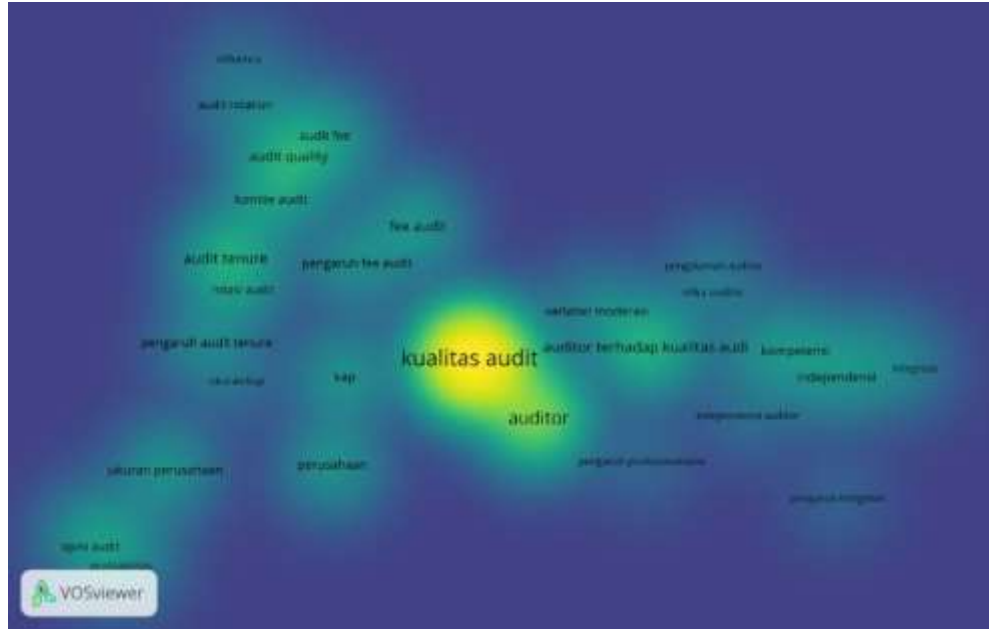


Figure 6. Density Visualization for Audit Quality

Figure 6 presents the density visualization results from VOSviewer showing the density of terms based on their frequency of occurrence in the literature. Lighter colors, particularly yellow, indicate areas of high density, indicating that the term is frequently used and is the center of attention in the research. The terms “audit quality” and “auditor” appear to be in the highest density areas, indicating that these two concepts are central to the academic discourse on auditing, as well as being the main link between other topics around them.

In contrast, terms such as “audit opinion,” “auditor ethics,” “integrity,” and “auditor experience” appear in areas of lower density (highlighted in blue-green), indicating that these topics are relatively less discussed or are just beginning to receive attention in the literature. This visual pattern provides important insights into the research map and potential for future exploration, where researchers may consider delving into under-researched topics that have high relevance to audit quality. Thus, this density visualization not only illustrates the intensity of scholarly focus, but also opens up opportunities for research development in areas that remain academically unsaturated.

CONCLUSION

Based on the bibliometric analysis of 500 scientific publications on the topic of audit quality during the period 2020-2024 obtained through Publish or Perish and visualized using VOSviewer, it can be concluded that the focus of research is still dominated by classic issues such as “audit quality” and “auditor” which are closely connected to the variables of independence, competence, professionalism, and integrity. Findings from the network visualization show that these themes are the main nodes in the research network, while the overlay visualization displays a shift in focus from organizational structure to individual auditor characteristics. Density visualization also revealed that these topics are the dense points of scholarly attention, while topics such as integrity, auditor experience, and ethics are still in low density, so they have the potential for further research. However, these findings have not highlighted the role of technological developments in audit practice, such as the use of big data analytics, artificial intelligence (AI), and digital audit applications such as ATLAS, which have become important factors in supporting audit quality in the digital era.

The practical implication of these findings is that audit organizations, regulators, and other stakeholders need to pay more attention to developing the capacity and quality of individual auditors, especially in terms of competence, integrity, and professional ethics. Training that emphasizes psychological and ethical aspects is important in improving overall audit quality. However, this study has several limitations, including only using one database (Google Scholar) and the Publish or Perish application, and only analyzing document metadata without examining the substantial content of each article. Therefore, suggestions for future research are to expand the scope of databases (e.g., Scopus or Web of Science), as well as conduct content analysis or systematic studies to deepen the understanding of the identified themes, especially those that are still rarely researched but have high urgency such as auditor integrity and time budget pressure.

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