ARTIFICIAL INTELLGINECE (AI) TOOLS FOR QUALITY ASSURANCE AND ACCREDITATION: A BIBLIOMETRIC ANALYSIS

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SieQA 2024 Navigating the Future — Advancing Quality Assurance in an AI-Driven Educational Landscape

ABSTRACT

The integration of Artificial Intelligence (AI) tools into quality assurance and accreditation processes has garnered increasing attention in academic and professional spheres. This study presents a comprehensive bibliometric analysis to analyse the evolution of AI applications in quality assurance and accreditation from 2004 to 2024. Using the Scopus database and keywords related to AI, machine learning, and quality assurance and accreditation, tools such as VOSviewer and Biblomagika were used to explore publication trends, subject areas, co-authorship networks, and the most productive countries, among others. By analysing publications indexed in prominent databases, the key research trends, influential authors, dominant publications, and collaboration networks within this emerging field are identified. In conclusion the findings highlight the evolution of AI-driven methodologies aimed at enhancing the efficiency, transparency, and accuracy of quality assurance processes in educational institutions and other sectors. This study would provide insights to the accreditation bodies to promote the use of AI in the internal quality assurance and accreditation related processes at the higher learning institutions.

INTRODUCTION

The integration of Artificial Intelligence (AI) into quality assurance (QA) and accreditation processes has become a focal point in both academic and professional spheres, particularly over the last decade. As educational institutions and other sectors increasingly seek to enhance the efficiency, transparency, and accuracy of their QA processes, AI-driven methodologies have emerged as a transformative tool. These methodologies are designed to automate and optimize various aspects of QA, ranging from data analysis to decision-making, thereby reducing human error and improving overall outcomes.

AI's role in quality assurance is not just limited to automation; it also extends to predictive analytics, where machine learning algorithms can forecast potential areas of concern before they manifest, thereby allowing institutions to take pre-emptive measures (Smith et al., 2021). Additionally, the use of AI in accreditation has been instrumental in streamlining the evaluation processes, making them more objective and consistent across different contexts (Miller et al, 2020).

Given the rapid advancements in AI and its application to QA, a comprehensive analysis of the research landscape is necessary. This study, therefore, conducts a bibliometric analysis to learn the trends, key subject areas and influential topics of publications that have shaped the field from 2004 to 2024. By leveraging databases such as Scopus and employing tools like VOSviewer and Biblomagika, the study provides a detailed overview of how AI applications in QA have evolved over the past decade.

This analysis not only highlights the key areas of focus within the field but also identifies the countries and institutions leading the way in AI-driven QA research. The findings offer valuable insights into the future directions of AI in quality assurance and accreditation, emphasizing its potential to revolutionize these critical processes in education and beyond.

METHOD

Research Design:
Bibliometric analysis, which is increasingly popular in academic research, was used in this study. The rise in its use is due to advancements in bibliometric software like Gephi, Leximancer, and VOSviewer, along with the availability of databases such as Scopus and Web of Science (WoS). These tools and resources help researchers analyze and study scholarly work more effectively.

Data Collection Method:
The study followed the PRISMA framework, which is commonly used in systematic reviews. PRISMA helps in clearly defining research questions, setting criteria for including or excluding studies, and reviewing large databases of scientific literature. This framework was applied to explore collaborative partnerships in higher education and quality assurance.

Resources:
The review used the Scopus database which provides access to more than 22,800 journals from around the world. The scope and coverage of the search is as shown in Figure 1 below.

Tools:

- **VOSviewer:** This tool was used to analyze keyword distribution by country and to create networks showing relationships between keywords, authors, and publications.
- **BiblioMagika:** This tool complements VOSviewer by analyzing citation metrics and author productivity. It also integrates well with other data visualization tools for deeper analysis.

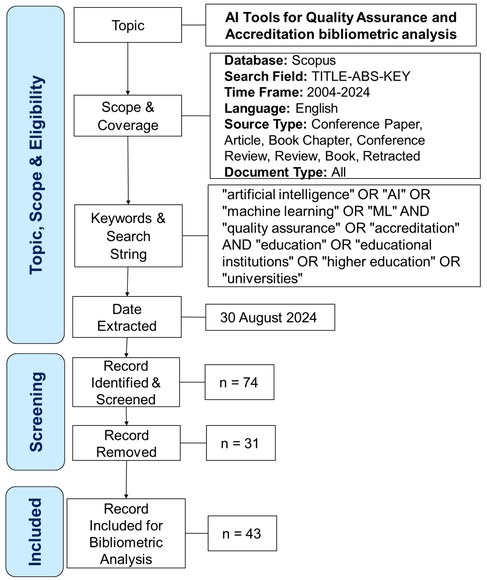

Figure 1: PRISMA flow diagram.

RESULTS & DISCUSSION

The study reveals a consistent increase in publications on integrating AI tools into quality assurance and accreditation processes from 2004 to 2024 with a notable surge in 2022 and 2023.

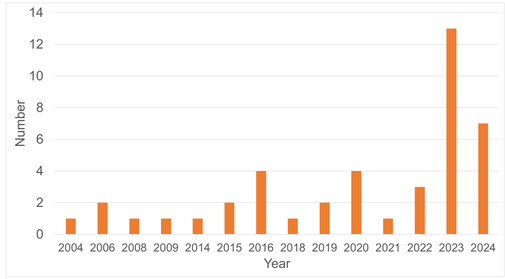

Figure 2: Analysis of records published by year.

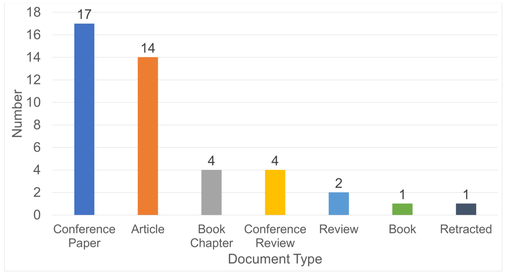

Figure 3: Analysis of records by document type.

Out of the 43 records analysed, conference papers constitute 39.53% of the total publications, while journal articles account for 32.56%. This indicates that while journal articles contribute to the formal academic literature, conference papers play a critical role in the timely dissemination of emerging research, fostering immediate discussion and collaboration among scholars and professionals.

Table below shows the top three subject areas and geographical distribution of research based on the screened records of publications on AI tools for quality assurance and accreditation.

Table 1: Top three subject areas and countries of authors.

Top Subject Areas		Top Countries of Authors	
Area	**Percentage of Records**	**Country**	**Percentage of Records**
Computer Science	32.43%	China	14%
Social Science	24.32%	India	10%
Engineering	13.51%	Australia	8%

The bibliometric analysis identified 770 citations across 43 publications, with an h-index of 9 and a g-index of 27. These metrics indicate that a substantial portion of the literature is having a meaningful impact, influencing subsequent research and practices in the field.

The most influential publications have focused on a range of topics, including the use of AI for plagiarism detection, enhancements in engineering education through AI, and AI's application in medical imaging for QA purposes. These works serve as foundational studies that have shaped current understanding and practices in AI-driven QA.

CONCLUSION

This bibliometric analysis, spanning the period from 2004 to 2024, has highlighted the growing body of research focused on AI applications in these areas, revealing key trends, subject areas, and influential topics.

The findings demonstrate that AI-driven methodologies are increasingly recognized for their potential to enhance the efficiency, transparency, and accuracy of QA processes. By automating routine tasks, providing predictive analytics, and enabling data-driven decision-making, AI tools are poised to redefine the landscape of quality assurance and accreditation.

As research in this field continues to evolve, it is expected that AI will play an even more central role in shaping the future of QA, offering innovative solutions that address current challenges and improve overall outcomes. This study contributes to the ongoing discourse by providing a comprehensive overview of the current state of AI applications in QA and accreditation, and it underscores the importance of continued exploration and collaboration in this rapidly advancing field.

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