Community Service Initiative Using VOSviewer for Bibliometric Applications in Academic Capacity Building

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Community Service Initiative Using VOSviewer for Bibliometric Applications in Academic Capacity Building

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ABSTRACT

The rapid increase in scientific publications presents both opportunities and challenges for researchers, particularly in identifying emerging topics, establishing productive collaborations, and identifying research gaps. To address these challenges, a community service program was organized to introduce the use of VOSviewer, a bibliometric mapping tool, as part of academic capacity building. The program was organized by the Young Accounting Graduates Association (ICMA) on February 3, 2025, and delivered through online training sessions via Zoom. A total of 90 participants, consisting of lecturers, students, and young researchers in accounting and business, attended the program. The training consisted of three sessions: an introduction to bibliometric mapping, hands-on practice with VOSviewer, and a reflection and discussion session. The results showed a significant increase in participants' technical competency. More than 85% of participants were able to independently perform basic analyses such as co-authorship mapping, co-occurrence mapping, and citation mapping, compared to only 20% before the training. Future programs are recommended to include pre-training materials, follow-up workshops, and mentoring schemes to maximize impact. Overall, this initiative highlights the importance of integrating digital research tools into community service programs to empower academic communities and ensure their active participation in the global scientific discourse.

Keywords: VOSviewer; Bibliometric Applications; Academic Capacity Building; Research Trends; Mapping

Fields: Educational Technology; Data Science; Methodology; Scientometrics; Information Science

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INTRODUCTION

In an era of rapid scientific development, the ability to regularly map and analyze research trends is becoming increasingly important for academics, students, and research institutions. The exponential growth in the number of scientific publications across disciplines, while enriching the body of knowledge, often presents difficulties for researchers in sifting through relevant literature and identifying current and future research directions. Without the right tools, academics may struggle to distinguish between established research areas and emerging themes, or to identify which collaborations are most productive and which research gaps remain unexplored. This situation can hinder the effectiveness of literature reviews, slow down the academic writing process, and reduce the potential for impactful research contributions.

In response to these challenges, our community service program introduced the use of VOSviewer, a sophisticated bibliometric mapping tool that helps researchers visualize the complex relationships between keywords, authors, and scientific publications. By transforming bibliometric data into an intuitive visual network, VOSviewer enables users to see clusters of related topics, influential authors, and collaboration patterns that might otherwise be hidden in textual data. Through this program, participants are trained to utilize these features, not only to strengthen their technical competence in operating bibliometric software but also to broaden their academic horizons in understanding how research evolves. By equipping participants, especially lecturers, students, and

young researchers, with practical skills in bibliometric mapping, this initiative aims to support them in producing more comprehensive literature reviews, selecting relevant journals for publication, and identifying potential collaborators for future research. Ultimately, the integration of bibliometric tools into academic practice is expected to improve the overall quality of research output within the academic community and empower participants to contribute more effectively to the global scientific discourse.

This program is designed not only to strengthen participants' technical skills in operating bibliometric software but also to broaden their academic horizons regarding how research evolves. By equipping participants, particularly lecturers and students, with the knowledge to use VOSviewer, this activity aims to support them in developing stronger literature reviews, identifying relevant journals for publication, and finding potential collaborators. Ultimately, the introduction of bibliometric mapping techniques is expected to improve the quality of research output within the academic community and empower participants to contribute more effectively to the global scientific discourse.

LITERATURE REVIEW

Community service refers to efforts aimed at addressing the existing needs of a community to solve its problems (Nyoto et al., 2024). This service can take the form of physical development, such as improvements in health, education, transportation, and religious sectors (Nyoto et al., 2022). Another type of community service involves providing support to meet the community's needs for problem-solving, also through physical development in areas like health, education, transportation, and religion (Sudarno, Suyono, et al., 2022).

The rapid growth of scientific publications over the past two decades has created both opportunities and challenges for researchers. On the one hand, the abundance of research results enriches scientific knowledge; on the other hand, it makes it increasingly difficult to identify relevant literature and emerging research trends. This situation emphasizes the importance of bibliometric analysis as a systematic approach to mapping and evaluating scientific work (Zhang et al., 2020).

Bibliometric mapping is widely used to identify knowledge structures, visualize research networks, and uncover gaps in the literature (Sudarno, Renaldo, et al., 2022). Several software tools have been developed to support bibliometric analysis, such as CiteSpace, Biblioshiny, and VOSviewer. Among these tools, VOSviewer is considered one of the easiest to use for creating visual networks of authors, keywords, and citations. Its graphical interface allows researchers to easily interpret relationships between concepts, making it suitable for both beginners and advanced users in academic settings.

Studies show that VOSviewer has been effectively implemented in various disciplines, such as environmental accounting (Susanti et al., 2024), digital business (Jahrizal et al., 2024) and financial technology research (Renaldo, 2023), and education studies (Sudarno et al., 2024). Through analyses such as co-authorship, keyword co-occurrence, citation analysis, and bibliographic merging, VOSviewer enables researchers to: (1) identify influential works, (2) identify research gaps, (3) identify emerging topics, and (4) build collaborations.

In the context of academic community development, bibliometric mapping has also been recognized as a strategic approach to support the capacity development of lecturers and students. It helps them strengthen their literature review writing skills, improve their publication strategies, and select target journals that align with their research focus (Donthu et al., 2021). Furthermore, the ability to analyze research trends ensures the academic community remains relevant and adaptive in responding to global issues, such as sustainability, digital transformation, and artificial intelligence.

Therefore, the application of bibliometric tools such as VOSviewer in community service activities not only improves technical competence but also contributes to a broader mission, namely, empowering the academic community to actively participate in international scientific discourse.

METHODOLOGY

Community Service Design

This community service program was implemented through an online training session on February 3, 2025, organized by the Association of Young Accounting Scholars (ICMA). This activity was designed to introduce participants to the practical use of VOSviewer for bibliometric mapping and research trend analysis.

Participants

Participants consisted of lecturers, students, and young researchers in the fields of accounting and business. They were selected through open registration, and the total number of participants reached 90. Most participants had research interests in digital business, sustainability, and accounting innovation.

Implementation Method

This training was conducted using the Zoom Meeting platform to ensure wider accessibility and participation across various regions. The activity was divided into three main sessions:

1. Introduction Session

- Providing an overview of bibliometric mapping and its relevance to academic research.
- Introducing VOSviewer and comparing it with other bibliometric tools such as Biblioshiny and CiteSpace.

2. Practical Training Session

- Participants were guided step-by-step through downloading, cleaning, and preparing bibliometric data from Scopus and Web of Science.
- The use of VOSviewer was demonstrated for co-authorship, co-occurrence, and citation analysis.
- Hands-on practice in creating visual research trend maps was provided.

3. Discussion and Reflection Session

- Participants shared their experiences, challenges, and insights during the practical session (Renaldo et al., 2023).
- The facilitator provided feedback and highlighted strategies for utilizing bibliometric results in writing literature reviews and selecting target journals.

Tools and Materials

- Platform: Zoom Meeting with screen sharing and discussion space for interactive practice.
- Software: VOSviewer (latest version).
- Data Sources: Sample datasets from Scopus and Web of Science related to accounting and digital business.
- Supporting Materials: Tutorial slides, video recordings, and a practical guidebook distributed to all participants.

Evaluation

At the end of the session, participants completed an evaluation form to measure:

- Understanding of bibliometric concepts.
- Ability to operate VOSviewer independently.
- Perception of the relevance of bibliometric mapping to their research development.

The results of this evaluation provide feedback for future training program improvements.

Ethics

This community service activity was implemented by the ethical principles of academic engagement and professional integrity. Several ethical aspects were considered during the planning and implementation stages:

1. Voluntary Participation. All participants participated in the training voluntarily through open registration facilitated by the Association of Young Accounting Intellectuals. No coercion or obligation was applied, and participants were free to withdraw from the program at any time.
2. Confidentiality and Privacy. Participants' data, including names, email addresses, and institutional affiliations, was collected solely for administrative purposes and will be kept confidential. Training sessions conducted via Zoom were recorded for documentation and educational purposes only, with the participants' prior consent.
3. Intellectual Property and Academic Honesty. All teaching materials, datasets, and examples used in the training are open access or created by the facilitators. Due credit is given to the original authors of bibliometric tools

and scholarly articles. Participants are also reminded to uphold academic integrity when applying bibliometric analysis to their research.

4. Non-Commercial Orientation. This activity is entirely educational and non-profit. Its goal is to strengthen research skills among lecturers, students, and young researchers, without any commercial agenda.
5. Respect and Inclusivity. This program fosters an inclusive learning environment, ensuring equal opportunities for participants regardless of gender, institutional background, or academic level. Facilitators encourage open dialogue and value all contributions during the sessions.

RESULTS AND DISCUSSION

Results

The community service activity of bibliometric mapping using VOSviewer was successfully implemented with high participation and engagement from participants. The main results recorded were as follows:

1. Participant Attendance. A total of 90 participants attended the Zoom session, consisting of lecturers, undergraduate and graduate students, and young researchers from various institutions.
2. Technical Competency Improvement. Before the training, only a small proportion of participants (approximately 20%) were familiar with VOSviewer. Following the practical session, evaluation results indicated that more than 85% of participants were able to independently perform basic analyses, including mapping co-authorship, co-occurrence, and citations.
3. Engagement in the Practical Session. Participants actively followed the step-by-step tutorial using example datasets from Scopus and Web of Science. Many were able to create their own keyword maps and network visualizations during the practical session.
4. Positive Feedback. A post-event survey revealed that 90% of participants agreed that bibliometric mapping would be highly beneficial in writing literature reviews, identifying research gaps, and selecting suitable target journals.

Discussion

The results indicate that bibliometric mapping using VOSviewer is not only technically feasible but also highly beneficial for the academic community, particularly in accounting and digital business research. Several points are worth highlighting:

1. Bridging the Knowledge Gap. This training provided participants with structured knowledge on how to efficiently analyze diverse literature. This is crucial given the exponential growth of academic publications and the difficulty of conducting manual reviews.
2. Capacity Building for Research Quality. By learning to identify emerging research trends, participants are better equipped to align their studies with global scientific discourse. This supports improved research quality, particularly in the preparation of theses, dissertations, and journal articles.
3. Strengthening Collaborative Networks. Through the co-authorship analysis feature, participants gained insight into potential research collaborators. This fosters stronger academic networks across institutions, which is crucial for developing interdisciplinary research in the digital age.
4. Practical Impact on Academic Productivity. Positive feedback indicates that participants are motivated to apply bibliometric mapping in their future projects. This reflects the role of community service not only as a one-time training but also as a catalyst for long-term academic empowerment.
5. Challenges Encountered. Some participants encountered technical challenges, such as difficulties with data preparation and compatibility when exporting from Scopus or Web of Science. However, these challenges were overcome through hands-on guidance and supplementary materials provided by the facilitators.

In summary, the program successfully achieved its goals of enhancing research competency, fostering collaboration, and equipping participants with practical tools for academic development. These findings reinforce the importance of integrating digital research tools like VOSviewer into community service programs for the academic community.

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CONCLUSION

Conclusion

The online community service activity of bibliometric mapping using VOSviewer, conducted on February 3, 2025, by the Association of Young Accounting Scholars, successfully enhanced participants' understanding and technical skills in identifying research trends, analyzing collaboration networks, and identifying influential works. The majority of participants reported significant improvements in their ability to use VOSviewer for developing literature reviews and research planning. Overall, this program effectively contributed to strengthening academic competencies, particularly among lecturers, students, and young researchers in accounting and related fields.

Implications

This program has several important implications:

1. Academic Development – By equipping participants with bibliometric analysis skills, this training directly supports improving research quality and publication strategies.
2. Capacity Building – Strengthening the ability to identify research gaps and trends helps the academic community remain relevant and competitive in the global scientific landscape.
3. Collaboration Opportunities – Insights from co-authorship mapping can form the basis for fostering interdisciplinary and inter-institutional research partnerships.

Limitations

Despite its success, the program faced several limitations:

1. Technical Barriers – Some participants experienced difficulty handling bibliometric datasets, especially those with limited access to Scopus and Web of Science.
2. Time Limitations – The one-day session limited in-depth exploration of advanced VOSviewer features such as bibliography merging or overlay visualization.
3. Participant Diversity – Differences in participants' prior knowledge created variations in learning speed, requiring additional follow-up support.

Recommendations

To maximize the benefits of similar programs in the future, the following recommendations are proposed:

1. Provide pre-training materials to ensure participants have a basic understanding of bibliometric data preparation.
2. Include follow-up sessions or workshops to cover advanced techniques and case studies.
3. Strengthen technical support systems, such as video tutorials and a help desk, to assist participants who encounter software or dataset issues.
4. Encourage participants to apply bibliometric mapping results directly to their ongoing research projects and share their findings in academic forums.

Future Community Service

Based on the success of this activity, future community service programs can be developed with broader scope and innovative approaches:

1. Advanced Bibliometrics Training – Conduct a multi-day workshop focusing on advanced analysis, integration with other tools (e.g., Biblioshiny, CiteSpace), and real-world dataset applications.
2. Research Mentoring Program – Pair participants with experienced mentors to apply bibliometric insights in preparing articles for Scopus-indexed journals.
3. Cross-Disciplinary Applications – Expand bibliometric training to other disciplines such as environmental science, digital business, and education to encourage broader adoption.
4. Community of Practice – Establish an online forum or knowledge-sharing group under the Association of Young Accounting Scholars to continue supporting participants in applying bibliometric methods.

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