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Bibliometric Analysis-Based Scientific Article Writing Training for Lecturers

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Abstract

Enhancing lecturers' research productivity is a strategic priority in higher education, particularly in institutions where publication performance is constrained by limited research mapping skills and low bibliometric literacy. This study addresses the need to strengthen lecturers' ability to identify research trends, position manuscripts strategically, and target reputable journals through a structured bibliometric training model. The community service program aimed to develop and evaluate a participatory bibliometric training framework to improve scientific article writing. Eight lecturers from the Diploma III Mechanical Engineering and Applied Bachelor MICE programs at PNJ PSDKU Demak were selected using purposive sampling, based on their active involvement in research activities and interest in improving publication skills. The training consisted of sequential stages: introduction to bibliometric concepts, systematic data retrieval from Scopus, article screening using PRISMA and PICOS, data visualization with VOSviewer and Biblioshiny, and guided manuscript development. Participants' cognitive improvement was measured using structured pre-test and post-test instruments assessing bibliometric understanding and research mapping skills, administered through an online questionnaire. Data were analyzed using descriptive statistics and the normalized gain (N-Gain) method. Results showed a significant increase in participants' competencies, with N-Gain scores ranging from 0.72 to 0.80, indicating high improvement. The findings demonstrate that integrating bibliometric mapping into academic writing training enhances strategic research awareness beyond technical writing skills. This model reconceptualizes bibliometric tools as pedagogical instruments and provides a practical, replicable framework for improving lecturers' publication performance and supporting sustainable quality education.

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INTRODUCTION

Bibliometrics is a quantitative method for analyzing trends, patterns, and the impact of academic literature within a field (Amin et al., 2022; Yadav et al., 2022). In scientific writing, bibliometric analysis enables lecturers to identify influential publications, leading authors, high-

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impact journals, and emerging research themes, helping them position manuscripts within current scholarly debates and avoid redundant research (Osman et al., 2025; L. Zhang et al., 2022). Mapping citation networks and keyword co-occurrences allows for more structured literature reviews, identification of research gaps, and selection of relevant references to enhance novelty and credibility. These skills help lecturers align research topics with scholarly trends and select suitable journals, increasing publication potential and academic visibility (Baum, 2011; Majhi et al., 2023; Zhang et al., 2023). Developing bibliometric competencies provides practical analytical skills for evidence-based writing and improves lecturers' ability to organize scientific literature, identify key studies, and map research developments (Jian et al., 2023; Marmoah et al., 2022). These competencies also support lecturers in mentoring students on systematic literature reviews and research proposals (Melo et al., 2022). Despite the increased use of bibliometric tools, many training programs still focus on theory without integrating practical writing or publication mentoring. This creates a gap between understanding bibliometric methods and applying them to produce publishable manuscripts (Chiang et al., 2018; Hajomer et al., 2022). Strengthening bibliometric competence among lecturers is therefore essential for improving research productivity, publication outcomes, and research literacy, and for supporting Sustainable Development Goal 4 (Quality Education) through enhanced teaching, supervision, and research-based learning.

Lecturer self-development is vital for maintaining and enhancing competence, particularly in research and publishing in reputable journals (Ng et al., 2022; Zupic & Čater, 2015). Scientific publications are key indicators for academic performance, promotion, tenure, and research funding in higher education (Kwiek, 2021; Teodorescu, 2000). Lecturers are expected to demonstrate consistent research productivity, yet many, especially early-career lecturers, face challenges with the scientific writing and publication process (Cabezas-Clavijo et al., 2023; Carroll et al., 2022). Bibliometric methods are often used for research evaluation rather than lecturer development (Beyoğlu & Hursen, 2023; Öztürk et al., 2024). Academic writing workshops typically emphasize conceptual knowledge without structured mentoring or integration with article development, limiting their effectiveness in increasing publication output (Lambrev & Caskey, 2025; Yu & Liu, 2021). This gap underscores the need for practical, integrated training approaches.

Lecturers at Jakarta State Polytechnic's PSDKU Demak, particularly in the MICE Applied Bachelor and Diploma III Mechanical Engineering programs, face challenges in writing scientific articles. Many struggle to identify suitable topics and maintain focus, leading to incomplete or disorganized work. Difficulties in constructing coherent sentences and ensuring logical flow further reduce writing quality. Limited proficiency with tools such as Mendeley, Grammarly, Turnitin, and SiPebi adds to these challenges. As a result, producing publishable articles in accredited journals becomes difficult, consistent with research showing that inadequate research mapping and limited experience with systematic literature analysis restrict publication productivity (Lee et al., 2020; Paliwal et al., 2023). Without targeted support, these issues may lower institutional research output and diminish contributions to national higher education initiatives.

Lecturers' success in writing scientific articles depends on their ability to overcome several common challenges in academic publishing. Previous research has shown that many academics experience difficulties in identifying relevant and high-quality literature, determining clear research gaps, organizing coherent literature reviews, and selecting appropriate target journals (Chigbu et al., 2023; Mitchell & Rich, 2022). For example, early-career academics often face barriers related to limited experience in structuring manuscripts and responding to publication standards, while many lecturers struggle with transforming research ideas into well-structured articles (Chigbu et al., 2023). Similarly, Cabezas-Clavijo et al. (2023), highlight that navigating the rapidly expanding volume of scientific publications and synthesizing them into coherent manuscripts remains a persistent challenge. These difficulties are particularly evident among early-career lecturers. To address these issues, previous studies emphasize the importance of targeted training and development programs that integrate writing skills, research methods, and publication strategies to enhance lecturers' scholarly productivity (Tatto, 2021).

To address these development needs, bibliometric analysis training provides an effective way to strengthen lecturer competencies. Research shows that bibliometric-based training helps researchers map trends, identify key publications, and develop stronger literature reviews (Zupic &

Čater, 2015). Lecturers use this method to collect and process data from scholarly databases and visualize publication relationships with tools like VOSviewer or Biblioshiny. These visualizations reveal emerging topics, dominant themes, and collaboration patterns, streamlining literature reviews and helping lecturers strategically position their research. The training also builds skills in analyzing, presenting, and writing bibliometric-based articles, increasing the likelihood of publication in reputable journals. This community service program addresses current training gaps by integrating bibliometric-based scientific writing. The model combines systematic reviews, bibliometric analysis, and manuscript creation in a single cycle. Unlike most programs that separate academic writing from bibliometric methods, this program merges systematic searching with PRISMA, Scopus data extraction, bibliometric mapping, and guided manuscript drafting. This integrated approach enables lecturers to transform findings into article sections and supports them through journal submission, providing practical, end-to-end training for producing publishable manuscripts.

This program offers an applied model for lecturer capacity building by bridging bibliometric theory and academic writing practice. It provides a scalable framework for higher education institutions to enhance research competence, improve publication outcomes, and support SDG 4 objectives related to higher education quality and educator competence. The program aims to: (1) enhance lecturers' competence in systematic literature searches using PRISMA and PICOS; (2) improve technical skills in bibliometric analysis and visualization with Scopus-based datasets; (3) strengthen the ability to interpret bibliometric findings into coherent scientific articles; and (4) support the production and submission of bibliometric-based manuscripts to accredited national journals. Success is measured by improvements in cognitive understanding of bibliometric concepts (via pre- and post-training assessments), the quality of literature review structures, the ability to generate bibliometric visualizations using VOSviewer or Biblioshiny, and the completion or submission of draft manuscripts. These indicators demonstrate measurable improvements in both cognitive competence and practical article production.

METHOD

The scientific article training for lecturers at the Jakarta State Polytechnic Study Program Outside the Main Campus (PNJ PSDKU) in Demak, Central Java, was designed using bibliometric analysis as the core training approach. In this program, bibliometric analysis functioned both as a training topic and as a practical analytical method that participants applied during the learning process. Participants were introduced to systematic literature identification, data extraction from the Scopus database, and bibliometric mapping using visualization tools such as VOSviewer and Biblioshiny. These activities enabled lecturers to analyze research trends, identify relevant literature, and transform bibliometric findings into components of scientific articles, particularly in the literature review and research gap identification stages.

A total of eight lecturers participated in the training, including three lecturers from the Applied Bachelor program in MICE and five lecturers from the Diploma III Mechanical Engineering program. Participants were selected using purposive sampling based on several criteria: (1) active lecturers in the PNJ PSDKU Demak programs, (2) lecturers who were involved in research or preparing scientific articles for publication, and (3) lecturers who expressed interest in improving their competence in bibliometric analysis and scientific writing. These criteria ensured that the participants had relevant academic responsibilities and motivation to apply the skills learned during the training.

The training was delivered in a blended learning format, combining face-to-face and online sessions. This approach was chosen to maximize learning effectiveness by integrating direct hands-on guidance with flexible follow-up mentoring. The in-person session allowed participants to receive intensive guidance in using bibliometric tools and conducting practical exercises, while the online session provided opportunities for further discussion, troubleshooting, and manuscript development after participants had practiced the techniques independently. The face-to-face session was conducted on 24 January 2026 at the 2nd Floor Meeting Room, Sultan Trenggono Street No.61, Katonsari, Demak, while the online session was held on 31 January 2026.

This community service program was developed using an adult learning and professional development framework based on experiential learning theory (Kolb, 1984) and competency-based training. The approach emphasized active engagement, reflective practice, and the application of skills in real-world settings. Because participants were experienced lecturers, the training used an andragogical approach (Knowles et al., 2014), with with activities that were problem-centered, relevant to their professional needs, and directly applicable to their publication goals.

The activity consists of three stages: preparation, implementation, and evaluation. During the preparation stage, training modules, presentation materials, and administrative tools (such as invitations and Google Forms for pre- and post-tests) are developed. The implementation stage includes the delivery of bibliometric analysis materials, guided practice in literature data collection and mapping, and mentoring in article development based on bibliometric findings. Participants are assigned to develop a draft scientific article that applies bibliometric analysis to their respective research topics. The expected output of this activity is a bibliometric-based article manuscript consisting of key sections such as the introduction, systematic literature review, bibliometric visualization results, discussion of research trends, and conclusions. Each participant or small group is encouraged to prepare a complete manuscript that is ready for submission to accredited national journals indexed in SINTA.

An offline workshop was held on January 24, 2026, covering data collection, analysis, and interpretation in bibliometric-based scientific articles. This session focused on practical exercises in extracting data from the Scopus database, conducting bibliometric mapping using VOSviewer or Biblioshiny, and structuring the results for academic writing. This was followed by online guidance on January 31, 2026, which focused on reviewing manuscript drafts, refining article structures, and preparing submissions to target journals. In the evaluation stage, participants completed pre- and post-tests via Google Forms to measure improvements in their understanding of bibliometric concepts, provided feedback on the training process, and participated in article review sessions. Figure 1 presents the details of each stage.

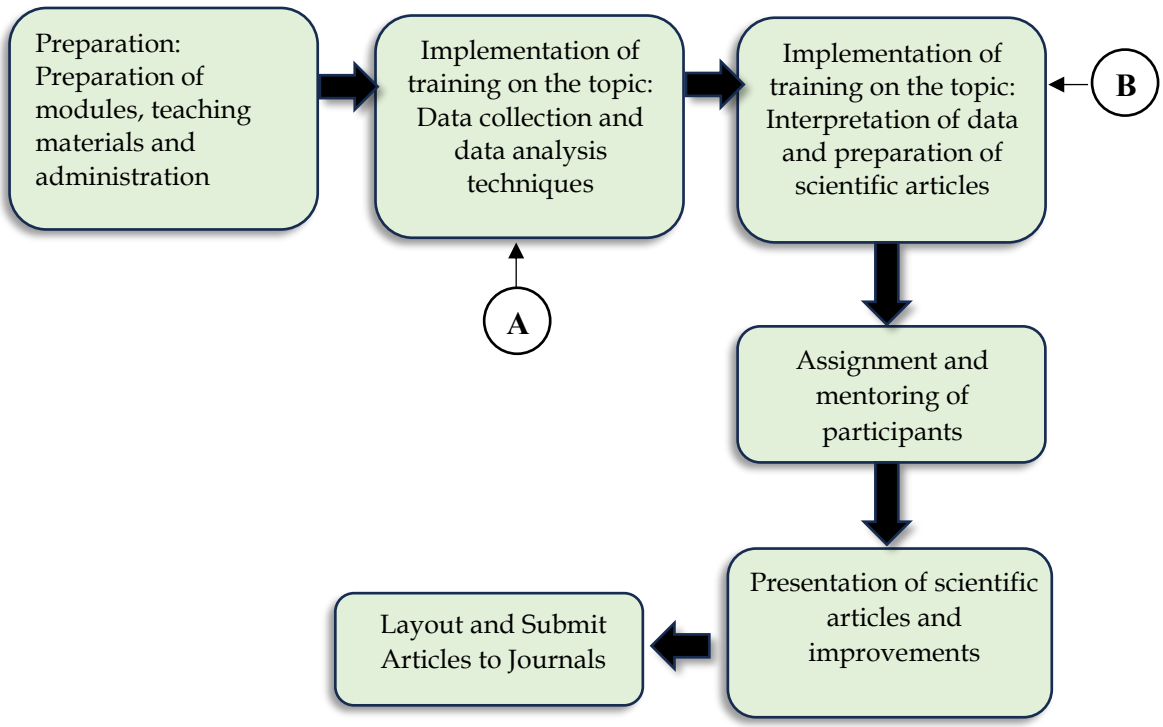

Figure 1. Stages of Mentoring Implementation

Figure 2 outlines the implementation flow for bibliometric analysis training. The process begins by selecting research ideas based on the field of interest and identifying relevant keywords for database searches, such as Scopus. Research construction follows the PICOS framework. Data

sets are then retrieved from Scopus using the PRISMA principle, which includes identification, screening, eligibility, and inclusion stages. Boolean operators are applied to generate the initial data set. Screening is conducted using titles and abstracts to assess relevance and adequacy. Eligibility and inclusion steps ensure that the dataset meets the study criteria. Selection criteria may include year, document type, country, journal type, language, and access. Once selected, the data is prepared for further analysis in R Studio.

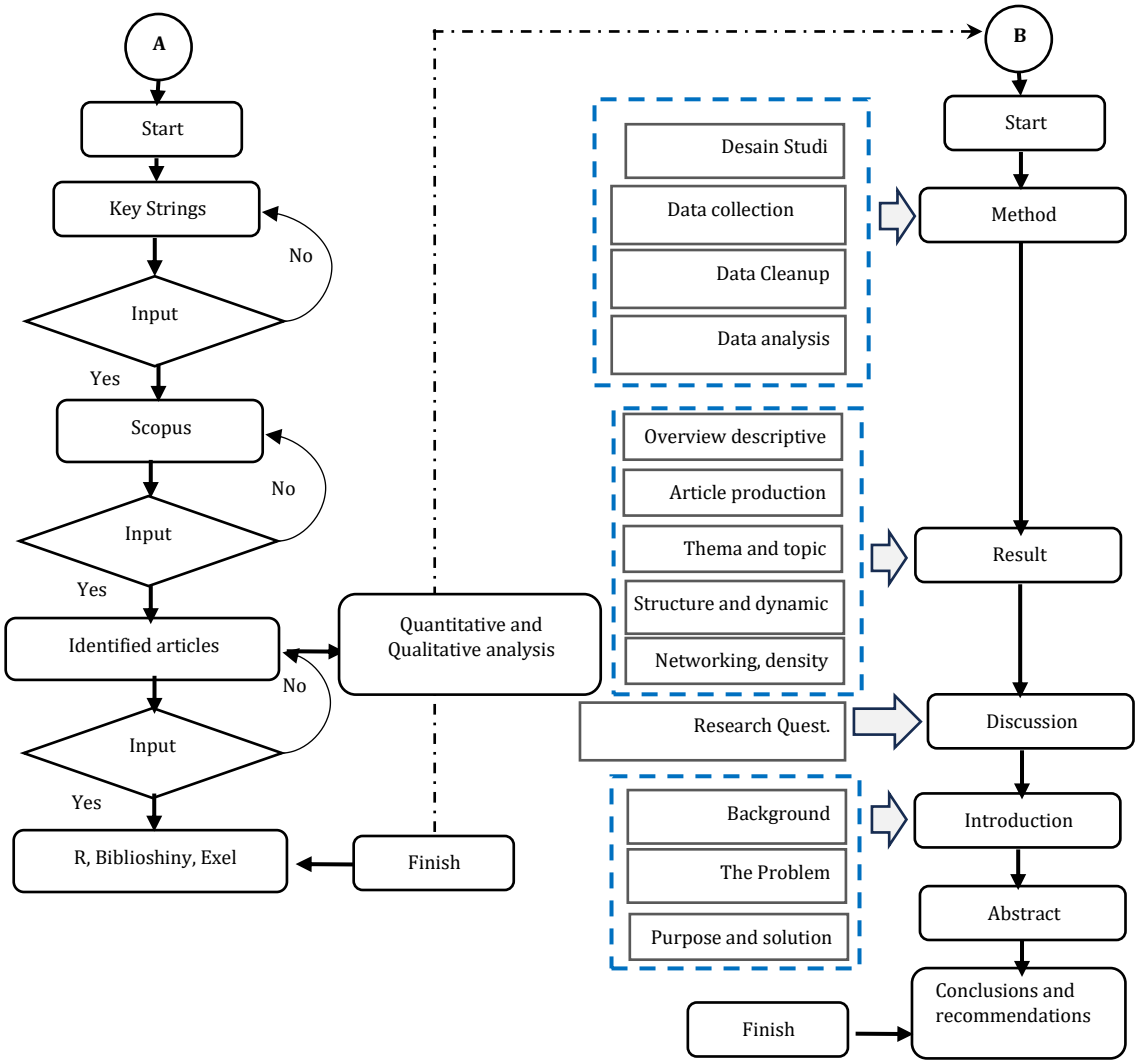

Figure 2. Stages of Mentoring Activities

The program's design follows participatory training principles, engaging participants as active contributors in building bibliometric datasets, interpreting results, and drafting manuscripts (Cornwall & Jewkes, 1995). This approach promotes collaborative problem-solving, peer discussion, and the adaptation of bibliometric techniques to each lecturer's research area. Training in writing scientific articles using the bibliometric method was delivered through lectures, discussions, workshops, and mentoring. Lectures and discussions presented conceptual material and encouraged active engagement, while workshops and mentoring provided hands-on practice in analyzing bibliometric data and preparing scientific articles. The lecture component provided conceptual scaffolding, whereas workshops and mentoring offered experiential, practice-based learning aligned with experiential learning theory. Mentoring also functioned as guided practice that allowed participants to receive feedback and revise their manuscript drafts during the training process.

Program evaluation included quantitative and qualitative measures. Cognitive understanding of bibliometric concepts was measured using pre-test and post-test instruments administered

through Google Forms. The test items assessed several indicators, including participants' understanding of bibliometric concepts, knowledge of systematic literature search procedures using PRISMA and PICOS, ability to identify bibliometric data sources such as Scopus, and understanding of bibliometric visualization techniques using software such as VOSviewer or Biblioshiny. The improvement in cognitive understanding was calculated using the normalized gain (N-Gain) formula. The interpretation of N-Gain values followed common classification categories, where values below 0.30 indicate low improvement, values between 0.30 and 0.70 indicate moderate improvement, and values above 0.70 indicate great improvement.

In addition to cognitive evaluation, the program assessed participants' ability to develop bibliometric-based article manuscripts. The assessment focused on several article components, including: (1) clarity of the research topic and problem statement; (2) completeness and relevance of the literature review derived from bibliometric data; (3) accuracy of bibliometric data extraction and visualization; (4) interpretation of bibliometric maps and research trends; and (5) overall structure and coherence of the manuscript based on scientific writing standards. Each component was reviewed during mentoring sessions and article review discussions. The evaluation framework incorporated elements of program evaluation theory, particularly Kirkpatrick's four-level model (Rucks et al., 2024), focusing on participant responses, cognitive learning outcomes, and the application of bibliometric techniques in manuscript preparation. Quantitative analysis was conducted using the N-Gain formula to measure cognitive improvement between pre-test and post-test results, while qualitative review was used to examine participants' manuscript drafts and their application of bibliometric techniques during the training process.

RESULTS

Preparation Activities

The team coordinated event logistics and requirements in consultation with lecturers. Discussions showed that lecturers often struggled with scientific writing, particularly in organization and structure, highlighting the need for targeted training. To facilitate data analysis and interpretation without field research, the team chose bibliometric analysis, which is accessible to all lecturers and widely accepted by journals. Training modules and PowerPoint materials were developed accordingly.

Implementation Activities

This training activity took place on Monday, January 23, 2026, starting at 9:00 a.m. WIB. Eight participants participated, consisting of lecturers, educational staff, and the Secretary of the PSDKU Demak Campus Coordinator, who also gave remarks and opened the event (Figure 3). Following the opening, participants completed a pre-test to assess their initial understanding of the literature study research.

Figure 3. Opening and Implementation Activities

The training was held on Monday, January 23, 2026, starting at 9:00 a.m. WIB. Eight participants attended, including lecturers, educational staff, and the Secretary of the PSDKU Demak Campus Coordinator, who delivered opening remarks (Figure 4). After the opening, participants completed a pre-test to assess their initial understanding of the literature study research. Next, participants assessed document suitability and recorded the number of eligible documents. The

final stage involved confirming that the selected articles aligned with the research objectives and establishing inclusion and exclusion criteria. The resulting documents were then analyzed using bibliometric software. These steps follow the PRISMA or PICOS approach, commonly used in systematic reviews. The Identification, Screening, Eligibility, and Inclusion stages ensure that selected documents meet research objectives and accurately represent the studied context.

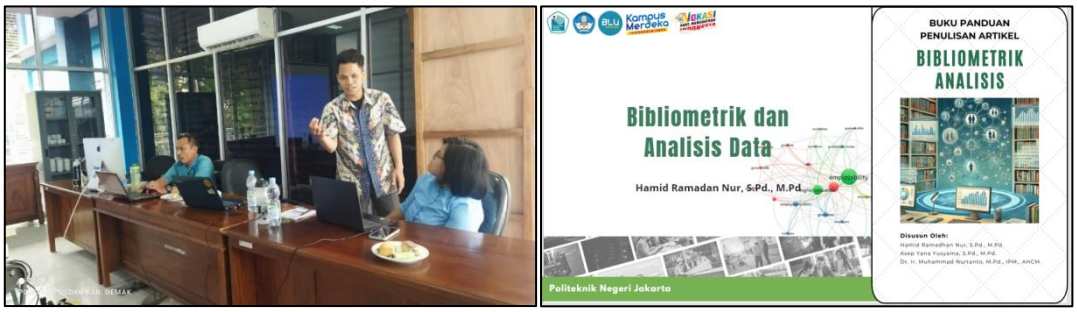

Figure 4. Presentation of Material 1 and Data Analysis using Bibliometrics

This example outlines the stages involved in searching for and selecting data prior to analysis with Bibliometric software. First, participants identified relevant literature using the PICOS approach (Table 1). Next, they defined the research objective and selected keywords that matched the research question to guide article searches in the Scopus database.

Table 1. Example of an article search using the PICOS approach

Element		Description
Population	:	Research articles related to hybrid vehicle emissions have beem published globally in reputable journals.
Intervention	:	Analysis and reduction of emissions in hybrid vehicle technology
Comparison	:	Other methods and technologies used to reduce vehicle emissions such as electric and conventional vehicles.
Outcomes	:	Findings regarding global research contributions, hybrid vehicle emissions trends, and future prospects for emissions reductions.
Study	:	Studies using experimental methods, comparative studies, and literature reviews on hybrid vehicle emissions.
Research Question	:	1. Emissions and electric vehicle research trends 2. Emission control technologies in conventional and hybrid vehicles
Data Boolean	:	("hybrid vehicle" OR "hybrid electric vehicle" OR "low-emission vehicle") AND ("emission reduction technologies" OR "pollutant emissions" OR "exhaust emissions")

Participants used Scopus data and followed a structured process of identification, screening, eligibility, and inclusion. Boolean queries ("hybrid vehicle" OR "hybrid electric vehicle" OR "low-emission vehicle") AND ("emission reduction technologies" OR "pollutant emissions" OR "exhaust emissions") identified 727 documents. During screening, studies not focused on emission control were excluded, reducing the pool to about 450 articles. In the eligibility stage, abstracts and methods were reviewed to ensure alignment with the research question, further narrowing the selection to approximately 200 articles. The inclusion stage classified documents by relevance to the research focus, resulting in 150 articles for systematic review. These articles addressed trends in electric and hybrid vehicle emissions research and emission control technologies for both conventional and hybrid vehicles. The presenter then described the process of downloading data for bibliometric analysis.

The second speaker discussed analysis techniques, data interpretation, and presentation in scientific articles (Figure 5). Initially, examples from accredited national and reputable international journals were shared to demonstrate data visualization and analysis strategies. A worksheet was then provided to support the development of a bibliometric display, customized to each article's requirements.

Figure 5. Presentation of Material 2 and Assistance in Data Analysis

This section presents and discusses the research results. The analysis includes descriptive analysis, citation analysis, co-authorship analysis, co-word analysis, and bibliometric visualizations. Descriptive analysis provides an overview of existing publications by collecting statistics such as the number of articles per year, publication distribution across journals or conferences, and researchers' institutional affiliations. Citation analysis quantifies the impact of articles, authors, or journals by counting citations, highlighting the most influential works in the field. Co-word analysis examines frequently co-occurring words or phrases to reveal key topics and themes. The final stage involves creating visualizations such as network maps, trend graphs, and density maps.

The next step is to develop the introduction, which should include the research background, the problem, the objectives, and the proposed solutions. This process guides participants in structuring their introductions. The research background provides context and significance for the topic, highlighting its relevance and urgency. The research problem identifies key obstacles or gaps within the topic. By clarifying these issues, participants can plan effective solutions and conduct more precise analyses. The research objectives address these problems, with bibliometric analysis focusing on identifying trends in the topic (Öztürk et al., 2024). The proposed solution outlines the approach to achieve these objectives. For this training, participants will use the Scopus database to access comprehensive and relevant data.

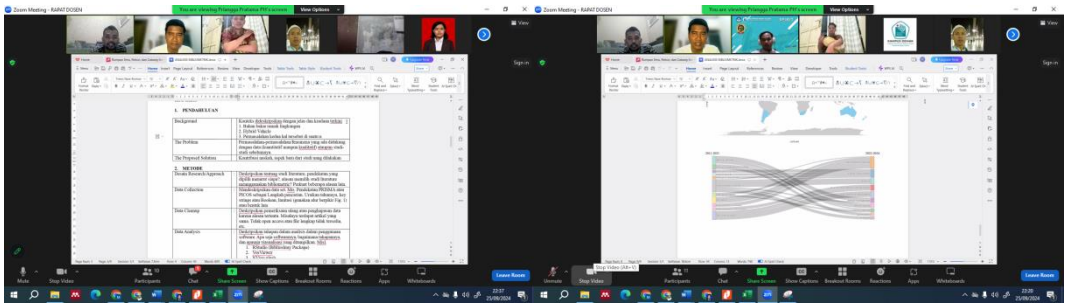

Figure 6. Online Advanced Article Support

The mentoring activity (Figure 6) is the final stage of the scientific writing training series. Its primary goal is to help participants enhance their writing quality. Participants receive guidance on writing structure, language use, and data analysis techniques. They are also encouraged to present data clearly and informatively using the provided worksheets. Through comprehensive mentoring, participants are better equipped to produce high-quality scientific articles with a greater likelihood of acceptance by their target journals or conferences.

Training participant evaluation activities

Evaluation activities were conducted at the end of the training, covering cognitive aspects and article writing skills using Bibliometric software. The following are the results of the cognitive assessment, including pre-test and post-test scores (Figure 7).

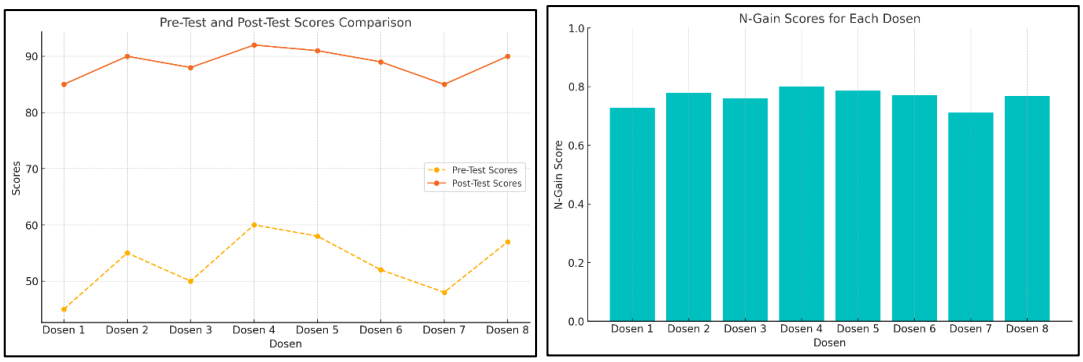

Figure 7. Comparison of Pre-Test and Post-Test Values and N-Gain Score

Bibliometric training led to improvements in lecturers' cognitive abilities, as reflected in the comparison between pre-test and post-test scores. The average pre-test score of participants was 58.6, which increased to 86.4 in the post-test, indicating substantial improvement in their understanding of bibliometric concepts and applications. The calculated N-Gain scores ranged from 0.72 to 0.80, which fall into the great improvement category, demonstrating considerable learning gains following the training (Lee et al., 2020; Paliwal et al., 2023). N-Gain scores demonstrate the training's effectiveness, particularly in areas such as PRISMA guidelines, VOSviewer, and bibliometric analysis techniques (Almasri et al., 2021). The training equips lecturers to identify, visualize, and organize relevant literature, which supports the writing of scientific articles (Amin et al., 2022). These skills are essential for enhancing research competence and successful publication in accredited journals. Additionally, tools such as VOSviewer enable lecturers to visualize research networks and citation patterns, helping them identify influential works and emerging trends (Beyoğlu & Hursen, 2023; Derbyshire et al., 2023).

Table 2. Results of the Evaluation of Article Compilation Progress Using Bibliometrics

No	Article Components	L1	L2	L3	L4	L5	L6	L7	L8
1	SLR introduction								
	1.1. Background	√	√	√	√	√	√	√	√
	1.2. The problem research	√	√	√	√	√	√	√	√
	1.3. Purpose and solution	√	√	√	√	√	√	√	√
2	SLR research method								
	2.1. Study design	√	√	√	√	√	√	√	√
	2.2. Data Collection (PRISMA or PICOS)	√	√	√	√	-	√	√	
	2.3. Data Cleanup	√	√	√	√	-	√	√	√
	2.4. Data Analysis	√	√	√	√	√		√	√
3	Results and implementation								
	3.1. Overview Descriptive	√	√	√	√	√	√	√	√
	3.2. Article Production	√	√	√	√	√	√	√	
	3.3. Thema and Topic Research	√	√	√	√	√	√	√	√
	3.4. Structure and dynamics	√		√	√	√	√	√	
	3.5. Networking and Density		√	√	√	√	√	√	√
	3.6. Research Question	√	√	√	√	-		√	√
	3.7. Discussion	√	√	√	-	√	√	-	-
4	Conclusion	√	√	√	√	√	√	√	-
5	Abstract and Keywords	√	√	√	√	√	√	√	√
7	Title, Author, Affiliation, Corresponding	√	√	√	√	√	√	√	√

Notes: L = Lecturer

The evaluation of article preparation during bibliometric training (Table 2) shows that all lecturers (L1-L8) performed well in key components, including background introduction, problem formulation, and research objectives. Most lecturers also demonstrated strong skills in study design and data collection (PRISMA or PICOS), reflecting a solid grasp of systematic literature review

methods. Some areas, such as data analysis, still need improvement, with L5 requiring additional guidance. In the results and discussion sections, several lecturers, including L4 and L5, have not yet completed the discussion or addressed the structure and dynamics of the topic, which are essential for explaining research findings and relevance. Overall, the lecturers have shown significant progress and a strong understanding of the bibliometric approach, though some areas require further development.

DISCUSSION

This community service program shows that bibliometric-based scientific article writing training improves lecturers' understanding and technical skills in preparing publishable manuscripts. Evidence of this improvement was obtained from the evaluation results, including the increase in pre-test and post-test scores and the review of participants' article drafts during the training program. The N-Gain results indicated substantial cognitive improvement, while the manuscript evaluation showed that most participants were able to develop key components of bibliometric-based articles, such as systematic literature identification, bibliometric visualization, and structured article sections. Through these processes, participants became more adept at identifying research trends, mapping relevant literature, and selecting suitable journals for publication. These findings are consistent with previous studies, which demonstrate that structured academic writing training significantly improves lecturers' research productivity and publication readiness (Bhatt & Samanhudi, 2022; Castillo-martínez & Ramírez-montoya, 2021; Hoang & Hoang, 2024; H. H. Zhang et al., 2025). Similar training initiatives in higher education contexts have shown that systematic mentoring, combined with practical exercises, increases confidence and writing self-efficacy among academics (Rohmatulloh et al., 2023; Schütze et al., 2021; Wei et al., 2024).

Integrating bibliometric analysis tools, such as VOSviewer, allowed participants to visualize research networks and thematic clusters. This approach helped lecturers understand emerging research directions and citation patterns in their fields. Unlike conventional academic writing workshops that focus on structure, language, and journal selection (Teng et al., 2022; Zhao, 2025), this training model uses bibliometric mapping as an analytical foundation for article positioning. While international studies highlight the value of bibliometric literacy for research evaluation and trend analysis (Ho et al., 2024; Kutlu-abu, 2023), its systematic use in community service-based lecturer training remains limited, especially in developing countries.

This highlights a clear contribution gap: although bibliometric tools are widely used for research assessment, performance evaluation, and meta-analytical studies, their application as pedagogical tools in academic writing training remains limited (Ellegaard & Wallin, 2015; Nurtanto et al., 2025; Zupic & Čater, 2015). Most bibliometric studies focus on mapping research trends, citation networks, and knowledge structures within specific disciplines rather than using bibliometric mapping as a learning strategy to support manuscript development or academic writing instruction (Jing et al., 2024; Nurtanto et al., 2023; Yan & Zhiping, 2023). Consequently, few training programs integrate bibliometric analysis directly into the process of teaching lecturers how to construct literature reviews and position their research for publication. This program addresses that gap by making bibliometric analysis a practical instructional tool for manuscript development. The participatory training design promoted active engagement through hands-on exercises and collaborative discussions. Participants set publication targets and refined article drafts. The approach is grounded in adult learning principles (Knowles et al., 2014; Kutlu-abu, 2023) and experiential learning theory (Kolb, 1984), which emphasize that professional competence develops best through reflective practice and direct application. Previous studies on lecturer development also show that sustainable improvement occurs when training combines theoretical input with guided practice and peer interaction (Desimone et al., 2002; Guskey, 2002).

Participants reported greater clarity in structuring introductions, strengthening literature reviews, and aligning research topics with global scholarly conversations. These results support recent research showing that capacity building for publication should address both writing mechanics and strategic positioning within indexed databases and citation networks (Busse et al., 2022; Nurtanto & Nur, 2024; Stahlschmidt & Stephen, 2022). In this training program, the use of bibliometric tools enabled participants to map research trends, identify influential publications,

and determine appropriate target journals for submission. These practical outcomes demonstrate how bibliometric-based training can support lecturers in positioning their research more strategically within international scholarly communication. As a result, participants were better able to develop article drafts that align with current research themes and publication standards in indexed journals. This program developed a conceptual model of bibliometric-based writing training that integrates data-driven topic mapping, journal-targeting strategies, and structured mentoring. The model provides a replicable framework for higher education institutions aiming to improve lecturers' publication performance in indexed journals. However, the training duration was relatively short, and long-term publication outcomes have not yet been measured.

Future evaluations should assess sustained publication productivity and citation impact. Comparative studies across institutions or countries would further clarify contextual factors influencing the effectiveness of bibliometric-based training models. Overall, the findings indicate that bibliometric-based scientific article writing training is an innovative and relevant strategy for strengthening research capacity among lecturers. By connecting bibliometric analysis with academic writing pedagogy, this approach advances both theoretical discourse on research capacity development and practical strategies for achieving sustainable academic productivity.

CONCLUSION

This study demonstrates that training in scientific article writing, combined with bibliometric analysis, significantly enhances lecturers' ability to identify research trends, map scholarly conversations, and position manuscripts for publication. Participants showed measurable improvement in analyzing citation networks, selecting suitable journals, and structuring manuscripts to meet international standards. The program develops both technical skills and strategic research awareness by integrating bibliometric mapping into academic writing instruction. Instead of focusing solely on writing mechanics, the model provides data-driven insights into topic selection, journal targeting, and literature positioning. This integrative approach connects bibliometric analysis, academic writing pedagogy, and participatory professional development, extending the use of bibliometric tools from research evaluation to manuscript development. The findings present a scalable framework for higher education institutions seeking to improve lecturers' publication performance, particularly in indexed and international journals. This approach is especially valuable for institutions in developing contexts aiming to increase global research visibility and align with Sustainable Development Goal 4 (Quality Education). The study is limited by its short-term evaluation and absence of longitudinal publication tracking. Future research should include long-term indicators such as accepted publications, citation growth, and cross-institutional comparisons to assess sustained impact. Incorporating digital mentoring or AI-assisted bibliometric analytics may further enhance training outcomes. Overall, bibliometric analysis-based writing training is an innovative, evidence-based strategy to improve lecturers' research productivity and support sustainable academic capacity development in higher education.

AUTHORS CONTRIBUTIONS

MN contributed to the design of the training program, research planning, supervision, and manuscript review. HRN was responsible for project coordination, managing training activities, and facilitating the sessions. CA contributed to developing the training methods, preparing materials. NI assisted in coordinating participants, documenting activities, and supporting data collection. RFH contributed to designing research instruments, conducting pre-test and post-test assessments, and preparing reports. GKK provided methodological input, validated the research framework, and reviewed the manuscript. FM handled data analysis, including N-Gain calculations, and prepared data visualizations. NK contributed to the literature review, manuscript drafting, and language editing. IHB contributed to interpreting the results, providing an international perspective, and refining the manuscript.

REFERENCES

Almasri, H., Zakuan, N., Amer, M. S., & Majid, M. R. (2021). A Developed Systematic Literature Review Procedure with Application in the Field of Digital Transformation. *Estudios de Economia Aplicada*, *39*(4). https://doi.org/10.25115/eea.v39i4.4559

Amin, M. N., Ahmad, W., Khan, K., & Sayed, M. M. (2022). Mapping Research Knowledge on Rice Husk Ash Application in Concrete: A Scientometric Review. *Materials*, *15*(10), 3431. https://doi.org/10.3390/ma15103431

Baum, J. A. C. (2011). Free-riding on power laws: Questioning the validity of the impact Factor as a measure of research quality in organization studies. *Organization*, *18*(4), 449–466. https://doi.org/10.1177/1350508411403531

Beyoğlu, D., & Hursen, C. (2023). The Use of Technology in Geography Education Research: A Bibliometric Analysis. *International Journal of Emerging Technologies in Learning*, *18*(11), 196–210. https://doi.org/10.3991/ijet.v18i11.39253

Bhatt, I., & Samanhudi, U. (2022). From academic writing to academics writing: Transitioning towards literacies for research productivity. *International Journal of Educational Research*, *111*, 101917. https://doi.org/https://doi.org/10.1016/j.ijer.2021.101917

Busse, C. E., Anderson, E. W., Endale, T., Smith, Y. R., Kaniecki, M., Shannon, C., & August, E. T. (2022). Strengthening research capacity: a systematic review of manuscript writing and publishing interventions for researchers in low-income and middle-income countries. *BMJ Global Health*, *7*(2), e008059. https://doi.org/10.1136/bmjgh-2021-008059

Cabezas-Clavijo, A., Milanes-Guisado, Y., Alba-Ruiz, R., & Delgado-Vazquez, A. M. (2023). The need to develop tailored tools for improving the quality of thematic bibliometric analyses: Evidence from papers published in Sustainability and Scientometrics. *Journal of Data and Information Science*, *8*(4), 10–35. https://doi.org/10.2478/jdis-2023-0021

Carroll, M., Al-Busaidi, I. S., Coppell, K. J., Garrett, M., Ihaka, B., O'Shea, C., Wu, J., & York, S. (2022). Diabetes-related foot disease research in Aotearoa New Zealand: a bibliometric analysis (1970–2020). *Journal of Foot and Ankle Research*, *15*(1). https://doi.org/10.1186/s13047-022-00528-5

Castillo-martínez, I. M., & Ramírez-montoya, M. S. (2021). Research Competencies to Develop Academic Reading and Writing : A Systematic Literature Review. *Frontiers in Education*, *5*(January), 1–12. https://doi.org/10.3389/feduc.2020.576961

Chiang, H. S., Huang, R. Y., Weng, P. W., Mau, L. P., Tsai, Y. W. C., Chung, M. P., Chung, C. H., Yeh, H. W., Shieh, Y. S., & Cheng, W. C. (2018). Prominence of scientific publications towards peri-implant complications in implantology: A bibliometric analysis using the H-classics method. *Journal of Oral Rehabilitation*, *45*(3), 240–249. https://doi.org/10.1111/joor.12606

Chigbu, U. E., Atiku, S. O., & Du Plessis, C. C. (2023). The Science of Literature Reviews: Searching, Identifying, Selecting, and Synthesising. In *Publications* (Vol. 11, Issue 1, p. 2). https://doi.org/10.3390/publications11010002

Cornwall, A., & Jewkes, R. (1995). What is participatory research? *Social Science & Medicine (1982)*, *41*(12), 1667–1676. https://doi.org/10.1016/0277-9536(95)00127-s

Derbyshire, D. W., Barnett-Naghshineh, O., Roberts, B. R., Ghemmour, R., Reza, M. M., Rogers, M., & Fleming, L. E. (2023). Keywords are missing: Insights from the publication keywords, abstracts and titles of an environment and human health research group. *Equity in Education & Society*, *2*(3), 303–316. https://doi.org/10.1177/27526461231163326

Desimone, Laura M, Porter, Andrew C, Garet, Michael S, Yoon, Kwang Suk, &

Birman, Beatrice F. (2002). Effects of Professional Development on Teachers' Instruction: Results from a Three-year Longitudinal Study. *Educational Evaluation and Policy Analysis*, *24*(2), 81–112. https://doi.org/10.3102/01623737024002081

Ellegaard, O., & Wallin, J. A. (2015). The bibliometric analysis of scholarly production: How great is the impact? *Scientometrics*, *105*(3), 1809–1831. https://doi.org/10.1007/s11192-015-1645-z

Guskey, T. R. (2002). Professional Development and Teacher Change. *Teachers and Teaching*, *8*(3), 381–391. https://doi.org/10.1080/135406002100000512

Hajomer, R., ElGeed, H., Zaidan, M., Alali, F., & Ibrahim, M. I. M. (2022). Bibliometric Study of Pharmacy Practice Research in a High-Income Middle-Eastern Country: 15 Years Insight. *Journal of Hunan University Natural Sciences*, *49*(1), 14–23. https://doi.org/10.55463/issn.1674-2974.49.1.3

Ho, Y.-S., Al-Moraissi, E. A., Christidis, N., & Christidis, M. (2024). Research focuses and trends in literacy within education: A bibliometric analysis. *Cogent Education*, *11*(1), 2287922. https://doi.org/10.1080/2331186X.2023.2287922

Hoang, D. T. N., & Hoang, T. (2024). Enhancing EFL students' academic writing skills in online learning via Google Docs-based collaboration: a mixed-methods study. *Computer Assisted Language Learning*, *37*(7), 1504–1526. https://doi.org/10.1080/09588221.2022.2083176

Jian, M., Jin, D., & Wu, X. (2023). Research hotspots and development trends of international learning cycle model:Bibliometric analysis based on CiteSpace. *Heliyon*, *9*(11). https://doi.org/10.1016/j.heliyon.2023.e22076

Jing, Y., Wang, C., Chen, Y., Wang, H., Yu, T., & Shadiev, R. (2024). Bibliometric mapping techniques in educational technology research: A systematic literature review. *Education and Information Technologies*, *29*(8), 9283–9311. https://doi.org/10.1007/s10639-023-12178-6

Knowles, M. S., Holton, E. F., & A., R. (2014). *The Adult Learner: The definitive classic in adult education and human resource development* (8th Editio). Routledge. https://doi.org/10.4324/9781315816951

Kolb, D. A. (1984). *Experiential learning: experience as the source of learning and development* (Issue December). Prentice Hall. http://academic.regis.edu/ed205/Kolb.pdf

Kutlu-abu, N. (2023). Evolving trend of media literacy research : A bibliometric analysis. *Journal of Media Literacy Education*, *15*(1), 85–98.

Kwiek, M. (2021). The prestige economy of higher education journals: A quantitative approach. *Higher Education, 81*(3), 493–519. https://doi.org/10.1007/s10734-020-00553-y

Lambrev, V. S., & Caskey, M. M. (2025). Applying Cognitive Apprenticeship Model to Enhance Scholarly Writing: A Qualitative Study of Supporting EdD Students. *Innovative Higher Education*, *50*(6), 2297–2319. https://doi.org/10.1007/s10755-025-09824-x

Lee, K., Mileski, M., Fohn, J., Frye, L., & Brooks, L. (2020). Facilitators and barriers surrounding the role of administration in employee job satisfaction in long-term care facilities: A systematic review. *Healthcare (Switzerland)*, *8*(4), 360. https://doi.org/10.3390/healthcare8040360

Majhi, S., Sahu, L., & Behera, K. (2023). Practices for enhancing research visibility, citations and impact: review of literature. *Aslib Journal of Information Management*, *75*(6), 1280–1305. https://doi.org/10.1108/AJIM-11-2023-532

Marmoah, S., Gestiardi, R., Sarwanto, S., Chumdari, C., Maryani, I., & Info, A. (2022). A bibliometric analysis of collaboration skills in education. *Journal of Education and Learning (EduLearn)*, *16*(4), 542–551.

https://doi.org/10.11591/edulearn.v16i4.20337

Melo, J. M., Ribeiro, M. R., Telles, T. S., Amaral, H. F., & Andrade, D. S. (2022). Microalgae cultivation in wastewater from agricultural industries to benefit next generation of bioremediation: a bibliometric analysis. *Environmental Science and Pollution Research*, *29*(15), 22708–22720. https://doi.org/10.1007/s11356-021-17427-0

Mitchell, A., & Rich, M. (2022). Literature Reviews : What are the Challenges , and how can Students and new Business Researchers be Successful ? *The Electronic Journal of Business Research Methods*, *20*(3), 99–110.

Ng, J. Y., Dhawan, T., Dogadova, E., Taghi-Zada, Z., Vacca, A., Wieland, L. S., & Moher, D. (2022). Operational definition of complementary, alternative, and integrative medicine derived from a systematic search. *BMC Complementary Medicine and Therapies*, *22*(1). https://doi.org/10.1186/s12906-022-03556-7

Nurtanto, M., Adyani, A., Aziz, M. K. N. A., Umar, N., Sutrisno, V. L. P., Nawanksari, S., Thoharudin, M., Ilma, A. Z., & Kholifah, N. (2025). Educational Strategies for Addressing Student Anxiety and Depression through Artificial Intelligence: A Bibliometric and Conceptual Analysis. *Salud, Ciencia y Tecnologia*, *5*(1669), 1–15. https://doi.org/10.56294/saludcyt20251669

Nurtanto, M., & Nur, R. (2024). Community Service Initiative on Scientific Writing : Implementing Scaffolding to Enhance Academic Article Development. *Pengabdian Pendidikan Indonesia (PPI)*, *2*(03), 107–122. https://doi.org/10.47709/ppi.v2i03.5696

Nurtanto, M., Sudira, P., & Sofyan, H. (2023). A bibliometric analysis of teacher professional identity (TPI) for vocational education from 2004 to 2021. *AIP Conference Proceedings*, *2671*(March). https://doi.org/10.1063/5.0114242

Osman, M. A., Sheikh Farah, A. A., & Abdi, A. I. (2025). A bibliometric analysis of sustainable development research in higher education institutions (HEIs): key trends, global collaborations and influential contributions (2015–2023). *Cogent Education*, *12*(1), 2490436. https://doi.org/10.1080/2331186X.2025.2490436

Öztürk, O., Kocaman, R., & Kanbach, D. K. (2024). How to design bibliometric research: an overview and a framework proposal. *Review of Managerial Science*, *18*(11), 3333–3361. https://doi.org/10.1007/s11846-024-00738-0

Paliwal, M., Chatradhi, N., Tripathy, S., & Jha, S. (2023). Growth of Digital Entrepreneurship in Academic Literature: A Bibliometric Analysis. *International Journal of Sustainable Development and Planning*, *18*(6), 1929–1942. https://doi.org/10.18280/ijsdp.180629

Rohmatulloh, R., Nasrullah, R., Nurtanto, M., Bekmurzayeva, S., & Abduldayev, Y. (2023). Competency in scientific writing training for beginner researchers: NVIVO analysis. *Bulletin of Kazakh Leading Academy of Architecture and Construction*, *88*(2), 284–296. https://doi.org/10.51488/1680-080x/2023.2-28

Rucks, L., Wingate, L., López, M., Wilson Becho, L., FitzGerald, M., & Lis Dean, K. (2024). Leveraging the Kirkpatrick four-level model to evaluate evaluation capacity building work. *New Directions for Evaluation*, *2024*(183), 81–94. https://doi.org/https://doi.org/10.1002/ev.20619

Schütze, H., Bartyn, J., & Tapsell, A. (2021). Increasing self-efficacy to improve the transition to university: an Australian case study. *Journal of Further and Higher Education*, *45*(6), 845–856. https://doi.org/10.1080/0309877X.2020.1826034

Stahlschmidt, S., & Stephen, D. (2022). From indexation policies through citation networks to normalized citation impacts: Web of Science, Scopus, and Dimensions as varying resonance chambers. *Scientometrics*, *127*(5), 2413–2431. https://doi.org/10.1007/s11192-022-04309-6

Tatto, M. T. (2021). Developing teachers' research capacity: the essential role of teacher education. *Teaching Education*, *32*(1), 27–46.

https://doi.org/10.1080/10476210.2020.1860000

Teng, M. F., Qin, C., & Wang, C. (2022). Validation of metacognitive academic writing strategies and the predictive effects on academic writing performance in a foreign language context. *Metacognition and Learning*, *17*(1), 167–190. https://doi.org/10.1007/s11409-021-09278-4

Teodorescu, D. (2000). Correlates of faculty publication productivity: A cross-national analysis. *Higher Education,* *39*(2), 201–222. https://doi.org/10.1023/A:1003901018634

Wei, W., Cheong, C. M., Zhu, X., & Lu, Q. (2024). Comparing self-reflection and peer feedback practices in an academic writing task: a student self-efficacy perspective. *Teaching in Higher Education*, *29*(4), 896–912. https://doi.org/10.1080/13562517.2022.2042242

Yadav, A., Agrawal, R., Garg, R. K., & Sachdeva, A. (2022). Research Progress in Life Cycle Assessment for Sustainable Manufacturing Industries: A Bibliometric Analysis. *IOP Conference Series: Materials Science and Engineering*, *1259*, 012035. https://doi.org/10.1088/1757-899x/1259/1/012035

Yan, Li, & Zhiping, Wang. (2023). Mapping the Literature on Academic Publishing: A Bibliometric Analysis on WOS. *Sage Open*, *13*(1), 21582440231158560. https://doi.org/10.1177/21582440231158562

Yu, S., & Liu, C. (2021). Improving student feedback literacy in academic writing: An evidence-based framework. *Assessing Writing*, *48*, 100525. https://doi.org/https://doi.org/10.1016/j.asw.2021.100525

Zhang, H. H., Xu, X., Lei, V. N.-L., Hong, W. C. H., & Jie, W. (2025). Academic writing challenges and supports for early-stage Chinese postgraduates: A mixed-methods study on teaching-research integration, supervisor engagement, and self-efficacy. *PLOS ONE*, *20*(2), e0317470. https://doi.org/10.1371/journal.pone.0317470

Zhang, L., Carter Jr., R. A., Qian, X., Yang, S., Rujimora, J., & Wen, S. (2022). Academia's responses to crisis: A bibliometric analysis of literature on online learning in higher education during COVID-19. *British Journal of Educational Technology*, *53*(3), 620–646. https://doi.org/https://doi.org/10.1111/bjet.13191

Zhang, T., Zhang, B., Ma, X., Zhang, J., Wei, Y., Wang, F., & Tang, X. (2023). Research trends in the field of the gut-brain interaction: Functional dyspepsia in the spotlight – An integrated bibliometric and science mapping approach. *Frontiers in Neuroscience*, *17*. https://doi.org/10.3389/fnins.2023.1109510

Zhao, D. (2025). The impact of AI-enhanced natural language processing tools on writing proficiency: an analysis of language precision, content summarization, and creative writing facilitation. *Education and Information Technologies*, *30*(6), 8055–8086. https://doi.org/10.1007/s10639-024-13145-5

Zupic, I., & Čater, T. (2015). Bibliometric Methods in Management and Organization. *Organizational Research Methods*, *18*(3), 429–472. https://doi.org/10.1177/1094428114562629