Research Paper

Strategy and Implementation of Enhancing Scientific Publications Towards International Accreditation: A Case Study of the Geophysical Engineering Study Program

Wahyu Hidayat*, Uli Ulfa, Maman Rohaman, Wrego Seno Giamboro
Universitas Pembangunan Nasional Veteran Yogyakarta, Indonesia

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Abstract

Scientific publication is one of the primary indicators of academic quality and institutional reputation in higher education. This article discusses strategies and the implementation of enhancing scientific publications in the Geophysical Engineering Study Program as part of the effort toward international accreditation. The research method employed is a case study with a qualitative-descriptive approach through interviews, questionnaires, document analysis, and observation of academic activities. The findings indicate that the main challenges in publication include limited writing skills, a lack of global collaboration, and the high workload of the three pillars of higher education (teaching, research, and community service). Key success factors for publication are research data quality, academic writing skills, and access to international references. This article proposes strategies such as writing workshops, mentoring systems, strengthening collaborations, providing incentives, and improving research infrastructure. Implementing these strategies not only increases the quantity and quality of publications but also strengthens the study program's position in achieving international recognition.

Keywords: *Scientific publication, international acreditation, Geophysical Engineering*

INTRODUCTION

Scientific publication plays an important role as evidence of the academic contributions of lecturers and institutions to the advancement of knowledge. In the context of international accreditation, publications in reputable journals serve as a benchmark for the quality of higher education (Bonini et al., 2016; Hazelkorn, 2009; Ulker & Bakioglu, 2019). Within the framework of international accreditation, publications in reputable journals are considered a primary benchmark of higher education quality, as they reflect the institution's capacity to produce original, competitive research that is recognized by the international scholarly community. Consequently, reputable publications serve a dual function: strengthening the institution's academic reputation while simultaneously enhancing its competitiveness in the global arena (Dudin & Shishalova, 2019; Wilby et al., 2017). The Geophysical Engineering Study Program at UPN "Veteran" Yogyakarta currently faces the challenge of low publication productivity among lecturers and students. This condition hinders the achievement of key performance indicators and weakens its competitive position on a global scale. Therefore, a comprehensive strategy is required to enhance scientific publications as part of the roadmap toward international accreditation.

At present, the Geophysical Engineering Study Program at UPN ranks 9th out of 22 Geophysics Study Programs in Indonesia (Science and Technology Index, n.d.). The limited number of publications reflects the lack of documented and formally published research activities, both in accredited national journals and reputable international journals (Wager & Kleinert, 2011). Scientific publication is one of the primary indicators for assessing the academic quality and productivity of a study program, as well as a benchmark for its scientific contribution to the

Corresponding author's email: wahyu.hidayat@upnyk.ac.id

development of science and technology, particularly in geophysics, and for meeting national and international accreditation standards. The distribution of scientific publications indexed in SINTA from each Geophysical Engineering study program in Indonesia is presented in **Figure 1**. This distribution pattern illustrates research productivity across study programs and reflects the institutional capacity to support research and publication activities, serving as a key indicator of academic performance (Hall, 2011).

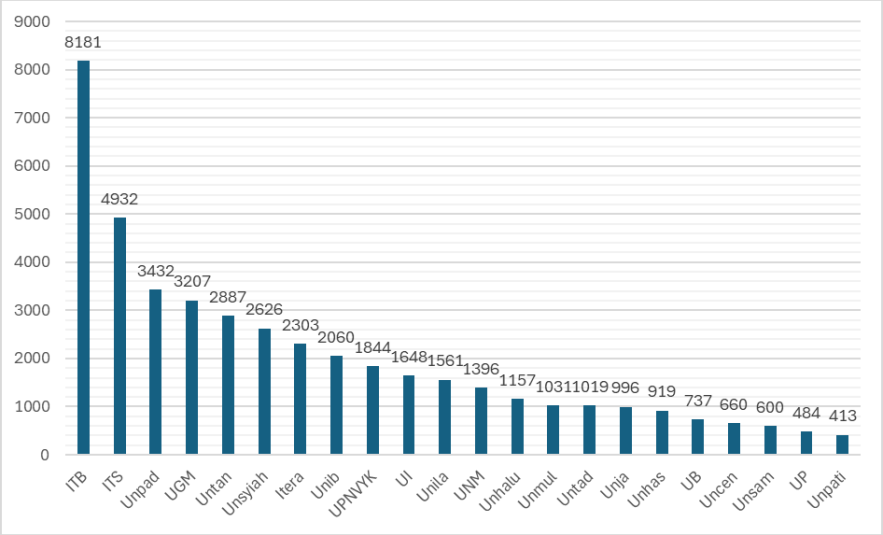

Figure 1. Relative position of the number of scientific publications in geophysics/geophysical engineering programs in Indonesia (Science and Technology Index, n.d.)

International accreditation bodies, such as ABET, EUR-ACE, or ASIC, consider research outputs and international publications as primary indicators of academic quality (Memarian, 2003). According to Hauptman Komotar (2020), engineering programs seeking global recognition must demonstrate their scientific contributions through publications in reputable journals. Blanco-Ramírez and Berger (2014) further emphasize that scientific publication not only serves as scholarly recognition but also functions as a medium for building institutional reputation at the global level, strengthening academic networking, and enhancing alumni competitiveness. Increasing the number of publications is crucial not only to support program and institutional accreditation but also to foster a strong research culture among faculty members and students. With the expansion of research and publication activities, it is expected that innovations, practical solutions to real-world problems, and broader collaborations with research institutions, government agencies, and industry will emerge. To achieve this, strategies and work programs must be developed with a focus on strengthening research and publication capacity. Planned measures include expanding scientific writing training, maximizing student research that is jointly written and published, fostering research collaborations with other institutions, and integrating research activities into the teaching curriculum. Through a sustainable and collaborative approach, the number and quality of scientific publications from the Geophysical Engineering Study Program are expected to increase significantly in the future.

LITERATURE REVIEW

A wide range of studies underline that scientific publication plays a central role in supporting accreditation processes and building the academic reputation of higher education institutions. Accreditation agencies for engineering and higher education programs consider scientific output, particularly publications in reputable journals, as a key benchmark for program quality and

internationalization performance (Memarian, 2003). Moreover, Hauptman Komotar (2020) highlights that academic publication performance contributes to global rankings and perceptions of institutional quality, thereby influencing not only internal academic assessments but also the international competitive standing of institutions. A combination of structural and cultural factors shapes publication productivity. Bland et al. (2005) stress the importance of a strong research culture, including research leadership, time structures that protect research activities, and a collegial environment, as the main predictors of faculty research output. At the institutional policy level, empirical studies show that clear and measurable incentive schemes can enhance publication motivation. Gunarto & Al Haddy (2023) and Rohmah et al. (2016) found that integrating financial and non-financial incentives into performance appraisal systems increased both the quantity and quality of publications in several universities. Academic writing training has also proven effective, as documented by structured workshops and manuscript clinics that significantly improved acceptance rates in both national and international journals (Abidin & Sabirin, 2021; Sugilar et al., 2019).

The aspect of research collaboration must also be emphasized. Cross-institutional and international collaboration often yields higher-quality publications with greater citation impact, a phenomenon systematically reviewed by Lee & Bozeman (2005). Collaboration opens access to broader datasets, methodologies, and reviewer/editorial networks, thereby increasing the chances of acceptance in reputable journals. In discipline-specific domains, such as geophysics, the adoption of innovative methods, for instance, the application of machine learning and big data analytics, has been reported to enhance the novelty and competitiveness of articles. The application of such methods adds value when combined with original datasets and robust research design (Mikalef et al., 2019).

From the perspective of institutional research management, organizing thematic research clusters aligned with the institutional roadmap is an effective strategy for consolidating resources and focusing publication efforts. Walker et al. (2008) demonstrated that well-structured research clusters facilitate project coordination, joint funding applications, and the formation of consistent author groups, all of which ultimately drive the production of high-quality publications. Bringing together these elements — research culture, incentives, training, collaboration, and thematic focus — constitutes a comprehensive approach recommended in the literature to enhance both productivity and the quality of publications at the program and institutional levels.

RESEARCH METHOD

This study employed a qualitative descriptive approach with a case study design. The choice of this approach was based on the research objective, which focuses on gaining an in-depth understanding of the phenomenon of low scientific publication productivity, the factors influencing it, and the strategies that the study program can implement. The case study design was selected because it allows the researcher to explore data comprehensively within a specific real-life context, namely the Geophysical Engineering Study Program at the Faculty of Mineral and Energy Technology, Universitas Pembangunan Nasional "Veteran" Yogyakarta.

The unit of analysis in this research was all faculty members within the study program, with emphasis on their experiences, perceptions, and publication strategies, both ongoing and previously implemented. To obtain rich and valid data, the research applied multiple data collection techniques (method triangulation), including:

Questionnaires

A structured questionnaire was distributed to all faculty members to gauge their perceptions regarding publication challenges, key success factors, and practical strategies. The questionnaire

consisted of both closed and open-ended questions to capture simple quantitative data as well as qualitative insights.

In-depth Interviews

In-depth interviews were conducted with senior faculty members who have experience publishing in reputable international journals. The interviews aimed to uncover best practices, challenges encountered, and adaptive strategies that could be replicated by other faculty members within the program.

Document Analysis

The documents analyzed included faculty publication records listed in SINTA and Scopus, study program accreditation documents, and institutional policies related to publication and incentives. A document analysis was conducted to obtain an objective overview of publication achievements and their alignment with national and international accreditation standards.

Observation

Observations were conducted during various academic activities, such as scientific writing workshops, publication-focused group discussions, and student supervision sessions for theses and final projects. These observations enabled the researcher to directly assess faculty participation, the effectiveness of activities, and the evolving research culture within the study program.

The data obtained from these four methods were analyzed descriptively and qualitatively by reducing the data, presenting findings in the form of narratives and tables, and drawing conclusions. The analysis process was iterative to ensure that the findings accurately reflected real conditions in the field. Data validity was strengthened through triangulation of sources and methods, thereby enhancing the reliability of the results.

FINDINGS AND DISCUSSION

Publication Challenges

The findings indicate that one of the main barriers to scientific publication in the Geophysical Engineering Study Program is the limited academic writing skills among faculty members. Many lecturers possess strong research potential but struggle to translate their findings into scientific articles that meet the standards of international journals. In addition, the high cost of publication, particularly in reputable Q1 and Q2 journals that impose substantial article processing charges (APCs), often discourages faculty members from submitting their manuscripts (Table 1).

Tabel 1. Inhibiting Factors and Publication Strategies

No	Inhibiting Factors	Impact	Strategic Solutions
1	Limited academic writing skills	Manuscripts rejected or of low quality	Writing workshops and clinics
2	Heavy tridharma workload	Divided faculty focus, hindered publications	Proportional workload management
3	Limited access to international databases	Outdated references	Library partnerships for database access
4	Lack of international collaboration	Less reputable publications	Joint research, visiting professors
5	High publication costs (APC)	Faculty reluctant to submit to Q1/Q2 journals	Institutional funding support for publication fees

No	Inhibiting Factors	Impact	Strategic Solutions
6	Weak research culture	Fluctuating and low productivity	Building a sustainable research and publication tradition

The findings indicate that one of the main obstacles to scientific publication in the Geophysical Engineering Study Program is the limited academic writing skills of faculty members. Although many lecturers possess strong research potential and generate relevant and original data, difficulties often arise in transforming these findings into systematic, argumentative, and journal-standard articles. This limitation not only results in low acceptance rates of submitted manuscripts but also diminishes the visibility and contribution of the study program's research within the global academic community. Additionally, financial constraints pose a significant challenge. The high cost of publication, particularly in reputable international journals (Q1 and Q2) that impose substantial article processing charges (APCs), often discourages lecturers from submitting their manuscripts for publication—the limited institutional support in the form of publication incentives or subsidies further compounds this situation. Consequently, despite substantial research potential, the dissemination of research findings in high-impact journals is frequently hindered. Ultimately, these barriers contribute to the relatively low quantity and quality of international publications produced by the study program.

Another major challenge is the limited global collaboration with foreign universities or research institutions. This condition restricts opportunities for faculty members to contribute to international-scale research, which is generally more likely to be accepted in high-impact journals. Equally important, the heavy workload of the three pillars of higher education (*tridharma*), particularly teaching duties with a high number of credit hours, leads faculty members to prioritize teaching over research and publication. The combination of these factors directly affects both the quantity and quality of publications produced. Abidin and Sabirin (2021); Blanco-Ramírez and Berger (2014); Hall (2011); Rohmah et al. (2016); Sugilar et al. (2019) describe that strategic efforts are required, including strengthening international research networks, optimizing workload management, and providing adequate institutional support to enable faculty members to focus more effectively on publishing in reputable journals. In this context, it is essential to identify the key factors that determine the quality of scientific publications. Understanding these factors not only facilitates the formulation of strategies to enhance research productivity but also ensures that the resulting publications meet global academic standards.

Determinants of Publication Quality

Despite these challenges, this study identified several key determinants that significantly influence publication quality. First, the quality of research data is fundamental; articles based on original, valid, and timely data are more likely to be accepted in reputable journals. Second, academic writing skills play a decisive role in presenting research findings systematically, logically, and in accordance with the editorial guidelines of target journals. Without strong writing competence, even high-quality research is at risk of rejection. Additionally, access to up-to-date references is crucial for strengthening arguments and establishing the current state of the art. Access to international databases, such as Scopus, Web of Science, ScienceDirect, or IEEE, enables faculty members to cite the latest and most relevant literature, thereby making their manuscripts more competitive on an international level. Thus, publication quality is the result of a synergy between data quality, writing competence, and accessibility of scholarly resources.

Implementation Strategies

Based on the findings, the proposed implementation strategies encompass five key aspects. First, writing workshops and clinics should be conducted regularly to improve faculty competence in producing reputable scientific articles, using reference management tools, and adhering to publication ethics. Second, a mentoring system should be established in which senior faculty members with international publication experience guide junior faculty in manuscript preparation. Third, global collaboration needs to be expanded through joint research, co-authored publications, and participation in international conferences. Fourth, institutions should provide proportional incentives based on journal rankings while also offering financial support to cover article processing charges (APCs). Finally, strengthening research infrastructure, such as establishing advanced laboratories, ensuring access to international databases, and providing modern analytical technologies, will enhance the competitiveness of publications. The implementation of these strategies is expected not only to increase the number of publications but also to ensure that the quality of articles meets international standards, thereby supporting the attainment of global accreditation.

The forward-looking development roadmap of the Geophysics Study Program holds a strategic role in supporting the attainment of international accreditation. This roadmap serves not only as a guideline for academic and research policy directions but also as a long-term planning instrument, ensuring that every step of the study program aligns with global quality standards. Through systematic planning, the roadmap can integrate various aspects such as enhancing faculty capacity, strengthening international research networks, developing outcome-based curricula, and improving the quality of scientific publications (Figure 2). Consequently, this roadmap functions as a strategic foundation for reinforcing academic competitiveness, expanding scientific contributions, and ensuring the program's sustainability in achieving international recognition.

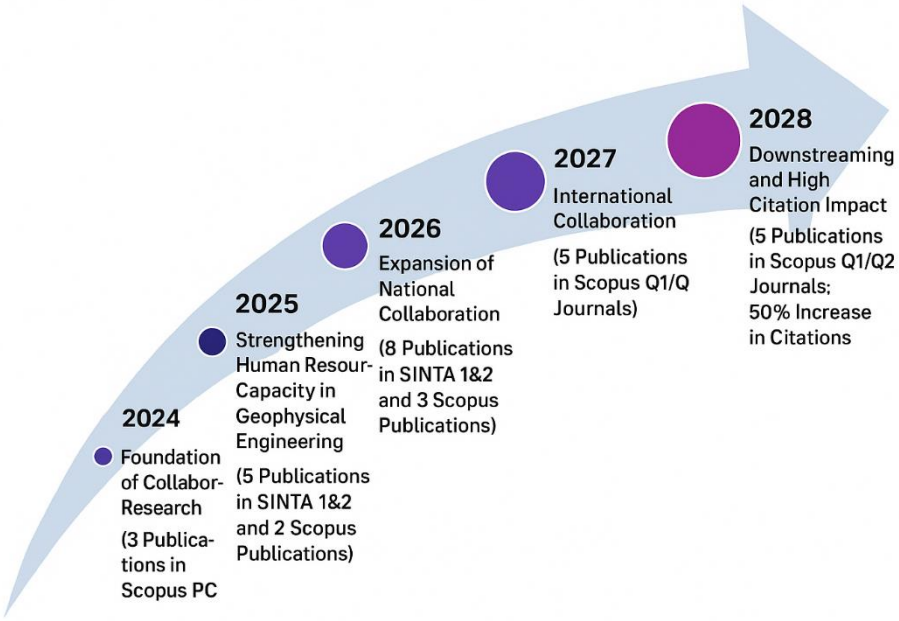

Figure 2. Research roadmap of the Geophysical Engineering Study Program 2024 - 2029

Discussion

The findings demonstrate a strong correlation between scientific publication and achieving international accreditation. Publications produced by faculty and students are not merely research outputs but also serve as essential indicators of the academic quality of a study program. Within

the framework of international accreditation systems, such as the IABEE (Indonesian Accreditation Board for Engineering Education) and ABET (Accreditation Board for Engineering and Technology), reputable publications are regarded as representations of research competence, relevance to knowledge development, and the ability of study programs to contribute to the global academic community. In other words, scientific publication serves a dual function: as evidence of academic quality and as a strategic instrument for the internationalization of higher education. Furthermore, reputable publications have a direct impact on institutional academic reputation. Articles published in international journals indexed by Scopus or Web of Science not only increase citation counts but also expand academic networks, thereby strengthening cross-national collaboration. This aligns with internationalization standards requiring tangible contributions to global forums.

Accordingly, the higher the quality of publications produced, the greater the likelihood for institutions to obtain international recognition in the form of accreditation. However, the success of publication enhancement strategies cannot be separated from institutional support. Higher education institutions must provide sufficient funding, particularly to cover article processing charges (APCs) in high-impact journals. Additionally, programs such as academic writing training, research methodology workshops, and academic language support are key elements in improving manuscript quality. Institutional policies that provide publication incentives and incorporate publication achievements into faculty performance evaluations have also proven effective in significantly boosting productivity. In short, reputable publications can only be achieved through synergy between individual researcher efforts and institutional structural support. When implementation strategies—from training and incentives to research infrastructure reinforcement — are carried out consistently, publication productivity can increase and ultimately strengthen the study program's position in achieving sustainable international accreditation.

CONCLUSIONS

Scientific publication is a crucial tool in facilitating the attainment of international accreditation for a study program, as it provides a tangible measure of academic contribution to the advancement of science and technology. Nonetheless, attaining esteemed publications is fraught with numerous hurdles. Inadequate academic writing abilities frequently constitute the primary impediment, followed by the substantial demands of the *tridharma* of higher education, which constrains instructors' capacity to concentrate on research and publishing. Moreover, restricted research collaboration, particularly with worldwide networks, diminishes the prospects for publishing in esteemed international publications. Conversely, determinants of publication success encompass the quality and originality of research data, proficient academic writing abilities, and access to current reference materials pertinent to global challenges. A comprehensive plan is necessary to address these challenges, encompassing training and writing clinics, enhancing the mentorship system, augmenting international collaboration, offering incentives based on publishing success, and establishing a robust research infrastructure. The implementation of this strategy is expected to enhance both the quantity and quality of scientific publications, while also strengthening the Geophysical Engineering Study Programs' standing in meeting international accreditation criteria and expanding its academic recognition globally.

LIMITATIONS & FURTHER RESEARCH

This study has several limitations; particularly, it concentrates mostly on the Geophysical Engineering Study Program at UPN “Veteran” Yogyakarta, which limits the generalizability of the findings to other study programs or institutions. Moreover, the dependence on qualitative data could contribute to subjective bias influenced by participants' perceptions and the institutional

context through data collection. The scope of the study was also limited to the analysis of the study program level, without covering the dimension of comparison across study programs or institutions.

For future research, it is recommended to use a multi-program study approach within UPN "veteran" Yogyakarta. Comparative studies between study programs can help identify universal and contextual factors that influence scientific publication performance. In addition, quantitative approaches can be combined with qualitative analysis to gain a more comprehensive understanding of the influence of institutional policies, culture research, and collaboration networks on scientific publication productivity.

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