

UNIVERSITI TEKNOLOGI MARA

**STRATEGIC COLLABORATIONS
AND RESEARCH DYNAMICS: A
COMPREHENSIVE BIBLIOMETRIC
ANALYSIS OF MALAYSIA'S
SCIENTIFIC OUTPUT, 2016-2020**

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ABSTRACT

This study presents a comprehensive bibliometric analysis of Malaysian research outputs indexed in the Scopus database from 2016 to 2020, encapsulating a dataset of 176,054 records. The analysis aims to dissect the state of scientific research, scrutinize collaborative patterns, and propose strategies to enhance research visibility and impact. Utilizing the SciVal tool, a robust platform for bibliometric analytics, this study systematically evaluates publication volumes, citation impacts, and co-authorship networks. The methodological approach involves quantitative assessments to identify trends and patterns in research outputs, supplemented by network analysis to map collaboration dynamics and influence. The findings demonstrate a robust upward trajectory in Malaysia's research output, with a significant 13.3% of publications consistently ranking within the top 10% of cited documents globally, and an impressive peak of 14.2% in 2020. This indicates the high impact and quality of Malaysian research, particularly in the fields of Engineering, Medicine, Materials Science, Computer Science, Physics and Astronomy, and the emerging field of Psychology. The study also underscores Malaysia's strategic role within the ASEAN research network, showcasing extensive regional collaboration with potential for growth. Despite the quantitative strength of the bibliometric approach, the study acknowledges limitations, including potential database comprehensiveness issues and the absence of qualitative analysis to capture the nuances of collaboration dynamics. Aligning with existing literature that emphasizes the nexus between collaboration and research impact, the study reinforces the importance of strategic international alliances. Based on the analysis, strategic recommendations are proposed to fortify Malaysia's research collaborations and visibility. These include incentivizing international partnerships, fostering interdisciplinary research, and enhancing support for high-impact research areas. Urging researchers, policymakers, and institutions to adopt and implement these strategies, the study emphasizes the urgency of action to leverage collaborative synergies and enhance Malaysia's stature within the global scientific community. This research contributes to the bibliometric field by offering a model for evaluating and strategizing research performance in emerging economies, laying a groundwork for policy formulation and strategic planning aimed at amplifying global research engagement and innovation.

Keywords: Bibliometric Analysis, Research Collaboration, Malaysia, Research Visibility, Scientific Impact, International Partnerships, ASEAN, Strategic Planning

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CHAPTER ONE

INTRODUCTION

1.1 Background and Context

In the dynamic landscape of contemporary scientific inquiry, the imperative for international collaboration has never been more pronounced. A comprehensive review spanning four decades, conducted by Aksnes et al. (2023), revealed a substantive escalation in international research partnerships, with the incidence of such collaborations augmenting from 4.7% in 1980 to a significant 25.7% by 2021. This trajectory underscores a paradigmatic shift toward a more integrated and symbiotic global research ecosystem, instrumental for addressing the complex, multi-dimensional challenges of the contemporary world.

Concomitant with the rise in international collaborations is the emergence of multidisciplinary research as a pivotal aspect of scientific endeavors, particularly accentuated during global crises such as the COVID-19 pandemic. A scientometric analysis highlighted a marked uptick in interdisciplinary engagements in 2020, demonstrating the critical role of diverse expertise in responding to unprecedented challenges, as underscored by Cunningham et al. (2021). This trend not only reflects the agile adaptability of the scientific community but also emphasizes the necessity for a broad-based, integrative approach to research in navigating and mitigating complex global phenomena.

Furthermore, the reshaping of global research partnerships, as exemplified by Iran forming alliances with ASEAN countries, has redefined the geopolitical landscape of science collaboration, moving beyond the traditional Western-centric models (Moed, 2016). These evolving dynamics represent not just a shift in partnership preferences but also a redistribution of scientific influence and resource sharing.

Collaborative research, especially in an age marked by globalization and a shift towards knowledge-based economies, necessitates a multidisciplinary *modus operandi* to address contemporary research problems effectively. This approach—where