



## Analyzing the Feasibility of Introducing Business Intelligence for Enhancing International Cooperation in the Ministry of Education, Culture, Research, and Technology of Indonesia

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### Abstract

International cooperation plays a crucial role in enabling public organizations to achieve their strategic objectives by utilizing business intelligence (BI) tools for informed decision-making. The quality of data and analysis significantly influences the formulation of effective cooperation strategies, particularly in identifying challenges, opportunities, and risks. Successful cooperation also depends on the availability of adequate financial, human, and technological resources, as well as strong institutional partnerships. This study examines the potential application of Business Intelligence (BI) to strengthen the international cooperation framework within Indonesia's Ministry of Education, Culture, Research, and Technology (MoECRT). The research addresses the current gap in optimizing data-driven policy support for international engagement, particularly in managing complex, cross-sectoral collaboration. It investigates how BI can contribute to improving strategic planning, operational efficiency, and responsiveness in foreign cooperation efforts through innovative approaches to data utilization. By analyzing Indonesia's institutional capacity and limitations in organizing international cooperation across education, culture, research, and technology, the paper offers practical insights into how BI integration can enhance performance. The study aims to contribute to the discourse on digital transformation and innovation in public sector cooperation, providing evidence-based recommendations for elevating MoECRT's global partnerships.

**Keywords:** international cooperation, business intelligence, digital transformation and innovation, organizational performance

### INTRODUCTION

International cooperation plays a vital role in enabling public organizations to achieve their strategic goals and objectives, particularly when

navigating complex global challenges. To support these efforts, organizations increasingly rely on knowledge mining intelligence—a process that involves extracting meaningful patterns and insights

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from large volumes of structured and unstructured data. For example, knowledge mining can be used to analyze international policy trends, stakeholder networks, or past cooperation outcomes to inform future decisions. The quality of information generated through such methods is critical for developing effective cooperation activity plans, as it helps identify key challenges, potential opportunities, and associated risks. Furthermore, successful international cooperation depends on the availability of sufficient financial, human, and technological resources, as well as strong partnerships that enhance institutional capabilities. Well-designed and well-coordinated plans are essential to overcoming barriers and ensuring the success of international engagements.

The Indonesian government has been actively pursuing international cooperation across various sectors, including education, culture, research, publications, and technology transfer, to advance its national interests (Soesilowati, 2017). These initiatives encompass sending students and teachers abroad, expanding scholarship opportunities for international students, and engaging in global forums. Moreover, the government has established Indonesian schools overseas and promoted exchange programs and dual degree collaborations (Soesilowati, 2017). Within this broader national agenda, the Ministry of Education, Culture, Research, and Technology (MoECRT) plays a pivotal role in implementing and managing many of these programs. As the key institution responsible for shaping education and research policies, the MoECRT's involvement is crucial to enhancing Indonesia's human capital, strengthening the country's international presence, and improving its global competitiveness. The internationalization of higher education, in particular, has emerged as a strategic pathway through which the MoECRT contributes to positioning Indonesia more prominently on the global stage (Soejatminah, 2009).

The Ministry of Education, Culture, Research, and Technology (MoECRT) has been actively involved in organizing and facilitating international cooperation. This article examines the MoECRT's potential in managing such cooperation by analyzing its available resources, organizational structure, strategic planning, programs, activities, and information systems. The purpose of this analysis is to assess the Ministry's institutional capacity to effectively support and expand international engagement. The discussion is supported by relevant academic literature to ensure a comprehensive and evidence-based evaluation.

This article explores how the integration of Business Intelligence (BI) systems can improve the performance of public organizations, particularly in the context of foreign cooperation. Business Intelligence in this context refers to the systematic use of data-driven tools and processes—including knowledge mining intelligence—as a subset focused on extracting actionable insights from large volumes of information. The article has three main objectives: (1) to assess the impact of knowledge mining intelligence on the quality of information gathered for international cooperation efforts; (2) to examine the correlation between information quality and the effectiveness of cooperation planning; and (3) to analyze how the availability of financial, human, and technological resources influences the organization's ability to engage in effective international cooperation. Through these objectives, the study aims to enhance understanding of how BI integration can optimize decision-making and overall performance in public sector organizations.

This article focuses on public organizations—specifically the Ministry of Education, Culture, Research, and Technology (MoECRT)—and aims to develop a practical framework for integrating Business Intelligence (BI) to enhance performance in international cooperation. The novelty of this study lies in its emphasis on aligning BI integration with the specific institutional characteristics and strategic objectives of the MoECRT, providing a tailored and operational model rather than a generic application. This article contributes to the fields of international cooperation, BI utilization in public sector organizations, and the advancement of organizational performance by offering a context-specific approach that bridges data intelligence with policy implementation.

## Globalization

Globalization has significantly influenced the landscape of international collaboration in education, fostering increased cross-border partnerships, student and faculty mobility, and the exchange of knowledge and innovation among higher education institutions. Globalization, the transformation of phenomena into global entities driven by economic, technological, sociocultural, and political forces (Croucher, Sheila L., 2004), fosters international cooperation in education, culture, research, and technology, transcending national borders. This collaboration spurs innovation, knowledge exchange, intercultural understanding, and addresses global challenges, promoting sustainable development (Bhagwati, Jagdish, 2004, Hirst, Paul and G. Thompson, 1996.).

In the context of international cooperation, several major challenges must be addressed to ensure equitable and effective collaboration. These include reducing inequality in access to education (Croucher, Sheila L., 2004), preserving cultural heritage amidst global integration (Bhagwati, Jagdish, 2004), promoting open access to research data for shared scientific advancement (Hirst, Paul & Thompson, G., 1996), harnessing technology to support sustainable development and improve healthcare systems (Subhash Chandra, 2018), and mitigating cybersecurity threats in an increasingly digitalized global environment (Tarozzi, M. & Torres, C. A., 2016). These issues require coordinated, cross-border efforts and shared commitment among international partners to ensure that cooperation leads to inclusive and sustainable outcomes.

### **Foreign Cooperation in a Changing Global Landscape**

International cooperation in education, culture, research, and technology fosters mutual understanding, diversity, and sustainable development (Teichler, 2015; Donetskaya & Zhan, 2019). Collaboration enables knowledge sharing, capacity building, and opportunities in international education, research, and innovation. Objectives include fostering cultural exchange, academic mobility, research and innovation, and building cross-national networks (Pinna, 2013; Donetskaya & Zhan, 2019). Research and technology cooperation promotes global innovation and knowledge-sharing (WIPO, 2018), while higher education internationalization encourages intercultural awareness and collaboration (Jibeen & Khan, 2015; Altbach & Knight, 2007). Research and development collaboration aims to spread findings and foster global cooperation (Hormia-Poutanen & Forsström, 2016). Cultural cooperation enhances exchange, heritage preservation, and intercultural dialogue (Pavlova & Trofimov, 2011). Countries collaborate at various levels, from state to individual, and through inter-institutional, interdepartmental, and other agreements (Park, S., 2018).

### **Potential and Limitations of Indonesia in the Framework of International Cooperation**

Indonesia holds substantial potential for advancing international cooperation, particularly in the fields of culture, education, and tourism (Ekasani & Bhuanaputri, 2019; OECD, 2020). The country's rich cultural diversity, growing higher education sector, and emerging research capabilities provide a strong foundation for global partnerships. With a

wide range of academic programs and an expanding network of universities, Indonesia offers opportunities for joint research, academic exchange, and cross-border innovation (Fadhil & Sabic-El-Rayess, 2021). Furthermore, the government has demonstrated commitment to modernizing the education system and promoting internationalization by fostering institutional collaborations with foreign universities and partners (Sutrisno, 2019). Strategically located in Southeast Asia, Indonesia is well-positioned to serve as a regional hub for international engagement, benefiting from its geographic, demographic, and economic significance (Zedilla, 2017). Continued investment in educational infrastructure, policy reform, and inclusive global cooperation are essential to unlocking Indonesia's full potential in the international arena (Fadhil & Sabic-El-Rayess, 2021).

However, several limitations continue to hinder Indonesia's efforts in deepening international cooperation, especially in the education sector. Persistent issues related to educational quality and inadequate funding limit the country's competitiveness in global academic and research collaborations (Shaturaev, 2022). Infrastructure deficits, particularly in remote areas, further exacerbate disparities in access to high-quality education and technology (Ray & Ing, 2016). Regulatory and bureaucratic hurdles—such as restrictive policies on foreign ownership and complex administrative procedures—pose additional barriers to foreign investment and institutional partnerships (Turner, Prasajo, & Sumarwono, 2019). Language proficiency gaps and limited international exposure among students and academic staff reduce the effectiveness of cross-border initiatives (Mulyani, 2018; Jurnal Antikorupsi, 2018). Moreover, cultural differences, political instability, and the absence of systemic incentives for international engagement contribute to institutional reluctance and uneven global outreach (Viartasiwi et al., 2021; Karim, 2021). Indonesia also faces the challenge of brain drain, with many highly educated individuals seeking opportunities abroad due to limited research capacity and weak academic career pathways at home (Yunitasari et al., 2021; Sri Wahyono, 2022).

Addressing these constraints requires not only structural and regulatory reforms but also a long-term commitment to fostering an enabling environment for inclusive, mutually beneficial international partnerships.

### International Cooperation in the Context of State Policy Implementation

Formulating coherent and forward-looking international cooperation policies is essential for Indonesia's effective engagement in the global arena. In an era marked by interdependence and complex global challenges, such as climate change, pandemics, and technological disruption, well-defined policies help safeguard national interests while fostering international collaboration (Mirjalolova, 2016). These policies also provide a framework for building strategic alliances, facilitating cultural and scientific exchanges, and advancing shared global objectives, including sustainable development, peace, security, and human rights. In this context, strategies play a crucial role in operationalizing these policies by offering a structured roadmap for implementing specific programs, initiatives, and projects. Strategic planning enables the alignment of national priorities with international commitments, ensures effective resource allocation, and provides measurable indicators for evaluating outcomes and impacts over time. Within this broader national framework, the Ministry of Education, Culture, Research, and Technology (MoECRT) serves as a key institutional actor. Through its strategic functions, MoECRT translates international cooperation policies into concrete initiatives in higher education, cultural diplomacy, scientific research, and technology partnerships. By fostering bilateral and multilateral collaborations, the Ministry enhances Indonesia's global presence while strengthening domestic capacity in education and innovation.

International cooperation strategies, crucial for policy implementation (Hakiem, Fadhlán & Amalia, 2021), should align with national priorities through a consultative process.

The MoECRT prioritizes international partnerships, collaborating with foreign governments, regional and multilateral organizations, for effective policy implementation in education, culture, research, and technology (Sri Wahyono, 2022).

To clarify how Indonesia's international cooperation policies are operationalized across different sectors, Table 1 summarizes the specific objectives, implementation strategies, and key stakeholders involved in each area. This structured overview helps illustrate how policy intentions are translated into concrete collaborative actions.

Table 1. Framework of State Policy Implementation for International Cooperation in the Field of Education, Culture, Technology, and Research

Area	Objectives	Implementation Strategies	Key Stakeholders
<b>Education</b>	Foster cross-cultural understanding and exchange	Establish student and faculty exchange programs with partner institutions	Ministries of Education, Culture, Research and Technology, universities and colleges, international education organizations
	Promote curriculum development and teacher training	Develop joint curriculum and training programs for educators	Ministries of Education, Culture, Research and Technology, schools and universities, education NGOs
<b>Culture</b>	Promote cultural diversity and exchange	Sponsor cultural exchange programs, festivals, and exhibits	Ministries of Education, Culture, Research and Technology, cultural institutions, international cultural organizations
	Preserve and protect cultural heritage	Develop partnerships for the preservation of historic sites and artifacts	Ministries of Education, Culture, Research and Technology, museums and cultural institutions, international cultural heritage organizations
<b>Technology</b>	Promote scientific and technological innovation	Establish collaborative research and development	Ministry of Education, Culture, Research and Technology, National Agency

Area	Objectives	Implementation Strategies	Key Stakeholders
		initiatives	for Research and Innovation, research institutions, technology firms
	Bridge the digital divide	Develop partnerships for technology transfer and access to digital resources	Ministries of Communication and Technology, NGOs, technology companies
Research	Advance knowledge and understanding	Facilitate joint research projects and exchange of scholars	Ministry of Education, Culture, Research and Technology, National Agency for Research and Innovation, research institutions, universities
	Promote interdisciplinary collaboration	Foster partnerships between research institutions and other sectors, such as industry and government	Ministry of Education, Culture, Research and Technology, National Agency for Research and Innovation, research institutions, private companies, government agencies

Source: developed by author based on: Nurcahyoko, K. (2016); UNESCO, 2019; OECD, 2019; European Commission, 2018)

The table highlights several key findings. First, the Ministry of Education, Culture, Research, and Technology plays a central role in nearly all sectors, underscoring its strategic importance in driving international cooperation. Second, implementation strategies consistently emphasize partnership-based approaches, from curriculum co-development to collaborative research. Finally, stakeholder

diversity—from universities and cultural institutions to private firms and NGOs—demonstrates Indonesia's recognition that effective cooperation requires multisectoral engagement.

Implementing international cooperation in public policy presents challenges, but the substantial benefits include knowledge expansion, mutual understanding, scientific innovation, and cultural exchange. These findings indicate Indonesia's strategic approach in actively pursuing global partnerships and collaborations. To maximize the impact of these efforts, it is essential to ensure that policies and strategies are consistently aligned. Such alignment strengthens Indonesia's position on the global stage by enhancing coherence, promoting sustained engagement, and reinforcing the country's role as a credible and capable international partner.

## METHODS

This article employs a descriptive-qualitative approach based on policy analysis and institutional review to assess the feasibility of integrating Business Intelligence (BI) into the international cooperation framework of Indonesia's Ministry of Education, Culture, Research, and Technology (MoECRT). The study seeks to address three core research questions: first, how knowledge mining intelligence influences the quality of information used in international cooperation; second, how the quality of such information contributes to the effectiveness of cooperation planning; and third, how the availability of financial, human, and technological resources affects the organization's capacity to engage in cross-border collaboration. These objectives reflect an exploratory orientation, emphasizing the strategic role of data in public sector decision-making.

The article relies primarily on document analysis and literature review as the main techniques for data collection. Various sources are examined, including official reports from MoECRT, statistical data on academic publications, and scholarly literature on internationalization policy, Business Intelligence, and public sector governance. Secondary data from institutions such as UNESCO, the OECD, and the QS Rankings are also utilized to evaluate Indonesia's global standing in education and research. The study not only describes existing practices and policies but also analyzes the institutional potential and limitations of MoECRT in adopting digital innovations such as BI.

In analyzing the data, the authors draw upon conceptual frameworks from the Business Intelligence literature, including contributions by Ziemba & Olszak (2012), Ranjan (2009), and Shah

(2012), who highlight the success factors and challenges of BI implementation in public organizations. The analysis focuses on three dimensions of BI integration: adoption, utilization, and success, and links these to MoECRT's institutional context. Additionally, a grounded policy analysis approach is used to assess the alignment between the Ministry's internal capacities and the external demands of globalization and digital transformation. This methodological framework enables a nuanced understanding of how BI can serve as a strategic tool to enhance organizational performance in international cooperation.

## RESULT AND DISCUSSION

### The Role of Business Intelligence in Improving International Cooperation Processes

In the era of digital transformation, public organizations, including those involved in international cooperation, are increasingly required to adopt data-driven approaches to support effective decision-making. Business Intelligence (BI) serves as a strategic method for targeting, tracking, interacting with, and converting external information into actionable insights that guide organizational decisions (Rouibah & Ould-Ali, 2002). By leveraging BI tools, public institutions can enhance their responsiveness, improve operational efficiency, and make informed policy choices aligned with global developments. BI is a complex information system that automates data collection from various sources, including internal and external sources, and processes the data to deliver high-quality information. (Michalewicz et al., 2006). The implementation of BI systems can provide public organizations with valuable information for enhancing their future performance.

In the context of public organizations, the successful integration of Business Intelligence (BI) is influenced by the nature of the information it processes, particularly its utility, quality, and value. BI tools are fundamentally engaged with transforming raw data into information that is not only relevant but also reliable and actionable. Since decision-making processes inevitably depend on the quality of available information, enhancing its utility, improving its quality, and increasing its value directly contribute to more effective decisions. This principle applies both to individual actors involved in international cooperation and to the Ministry as a whole, reinforcing the importance of embedding BI practices into organizational systems and strategies.

In order to integrate business intelligence (BI) systems, there are three main factors that need to be considered: adoption (initial usage of the BI system),

utilization (intensity of the BI system use), and success (satisfactory or favorable outcomes of the BI system). These factors have been identified as the main ways to integrate BI systems, and understanding their interplay is crucial to ensure the successful implementation and optimization of BI systems in public organizations.

Implementing Business Intelligence (BI) in foreign cooperation at the Indonesian Ministry of Education involves the strategic use of data mining methods to support evidence-based decision-making. For example, classification techniques can be used to personalize scholarship programs by categorizing applicants based on academic performance, field of study, or country preferences. Regression analysis helps forecast the success rates of student exchange programs by analyzing historical data on student outcomes and program satisfaction. Clustering methods enable the Ministry to group partner institutions or target regions with similar characteristics, allowing for more efficient resource allocation and program planning. Association rule mining can identify patterns in successful research collaborations, helping refine partnership strategies and curriculum development. Text mining is useful for analyzing feedback from international students and partner institutions, providing insights into public sentiment and areas for improvement. Lastly, pattern recognition assists in identifying trends related to attendance or completion rates in international training programs, enabling early interventions to reduce dropouts. Collectively, these methods support targeted, data-driven actions that enhance the effectiveness and quality of Indonesia's international cooperation in education.

### The Moecrt's Potential for Organizing International Cooperation In Education, Culture, and Research

The Ministry of Education, Culture, Research, and Technology (MoECRT) of the Republic of Indonesia has been actively involved in promoting international cooperation in education, culture, and research. This section will discuss the potential of the MoECRT in organizing international cooperation based on its funding resources, human resources, organizational structure, national strategic planning, tasks, programs, activities, mechanism, laws and regulations, and information system, supported by relevant academic articles.

The Ministry of Education, Culture, Research, and Technology (MoECRT) in Indonesia has been working to coordinate the efforts of various internal institutions and agencies, including universities,

schools, museums, and polytechnics, which all play a critical role in the country's international cooperation activities in education, culture, research, and technology. To enhance the quality of services and governance, these internal institutions and agencies must collaborate with one another and with external partners from other countries. In order to facilitate communication with related counterparts in partner countries, the MoECRT liaises with the Indonesian Embassy and its Attache of Education and Culture. This coordination and collaboration are vital to achieving the goals of improving the quality of services and governance in international cooperation.

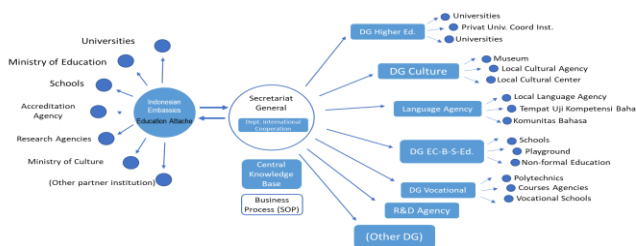


Figure 1. Relations between domestic parties and foreign partners in the management of foreign cooperation in Indonesia (developed by author)

The MoECRT's potential in organizing international cooperation depends on its funding resources. The MoECRT's budget allocation has been steadily increasing over the years. In 2021, the MoECRT received a budget of IDR 526.98 trillion (approximately USD 36.8 billion), which is a 12.6% increase from the previous year (Ministry of Finance, 2021). The MoECRT has several funding schemes to support international cooperation, including the Internationalization Program for Higher Education (IP-HE) and the Cooperation and Networking Program (PKLN) (MoECRT, 2020).

The Ministry of Education, Culture, Research, and Technology (MoECRT) possesses substantial human resources to support its international cooperation initiatives. As of 2020, the Ministry employed 1,640 civil servants and 375 non-civil servants (MoECRT, 2020). This staffing capacity reflects the institutional readiness to manage a wide range of collaborative activities, including scholarship administration, bilateral and multilateral partnerships, academic exchange programs, and international research coordination. The availability of a dedicated workforce enhances the Ministry's ability to respond to global engagement demands efficiently, ensuring that international cooperation efforts are well-structured, professionally managed, and aligned with national education and development

priorities. Additionally, the MoECRT has established various directorates to oversee international cooperation activities, including the Directorate General of Higher Education, the Directorate General of Culture, and the Directorate General of Research and Development (MoECRT, 2021).

In conducting cooperation with partner countries, The Bureau of Cooperation and Public Relations under Secretary General of MoECRT organized its activity in coordination with the Ministry of Foreign Affairs. Through the Ministry of Foreign Affairs, MoECRT liaises with the embassies of partner countries in Indonesia and Indonesian representatives abroad. This foreign ministry device facilitates communication with partner countries. The stakeholders are described in relation to each other in Figure 2. This coordination mechanism ensures the goals of the Ministry to achieve excellent service in foreign cooperation based on mutual cooperation.

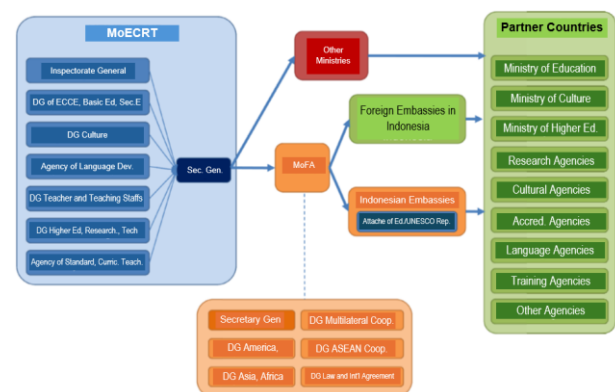


Figure 2. Stakeholder Governance of Foreign Cooperation in the Ministry of Education, Culture, Research, and Technology of The Republic of Indonesia (developed by author)

Figure 1 illustrates the multi-layered stakeholder governance structure through which MoECRT implements its international cooperation agenda. At the core of this structure is the Secretariat General, which serves as the central coordinating body, connecting various directorates and agencies within MoECRT—including those responsible for early childhood, basic, and secondary education, culture, teacher training, higher education, research, and curriculum standards. This internal coordination ensures that international partnerships align with national educational priorities across multiple subsectors.

The figure also highlights MoECRT's outward-facing interactions with external stakeholders. These include other domestic ministries that may co-develop or support cross-sectoral cooperation, the

Ministry of Foreign Affairs (MoFA) as a key diplomatic channel, and Indonesian embassies abroad—particularly education attachés and UNESCO representatives—who facilitate engagement with international partners. On the reciprocal side, foreign embassies in Indonesia act as conduits for collaboration proposals, academic exchanges, and institutional partnerships from partner countries.

Furthermore, the right side of the diagram emphasizes the diversity of international actors involved, such as ministries of education, culture, and higher education from partner countries, along with research, cultural, and language agencies. This reflects the broad and interdisciplinary scope of MoECRT's cooperation efforts.

Several insights emerge from this structure. First, the governance model demonstrates a networked and multi-stakeholder approach, which is essential for managing the complexity of international education cooperation. Second, the diagram highlights vertical and horizontal coordination mechanisms, showing how the Ministry interacts both across government levels and with international partners. Third, it underscores the importance of diplomatic integration, where MoFA and Indonesian embassies serve as bridges between national education policy and global engagement platforms.

Ultimately, the figure reflects how MoECRT's effectiveness in foreign cooperation depends not only on internal institutional capacity but also on its ability to navigate a wide array of stakeholders through clear communication, shared objectives, and coordinated implementation.

### **International Cooperation Programs and Activities of the MoECRT of the Republic of Indonesia**

Indonesia has been engaged in various international cooperation programs to improve the quality of early childhood care and education, as well as basic and secondary education. One of the major initiatives is the Southeast Asian Ministers of Education Organization (SEAMEO), which Indonesia is a member of. SEAMEO provides a platform for countries in the Southeast Asian region to collaborate and share best practices in education. Indonesia has participated in various SEAMEO projects, such as the SEAMEO Regional Centre for Early Childhood Care Education and Parenting (CECCEP) and the SEAMEO Regional Centre for Quality Improvement of Teachers and Education Personnel (QITEP) in Mathematics (SEAMEO, 2023).

International cooperation programs in the field of early childhood care and education, and basic and secondary education have been implemented by the Indonesian MoECRT. These programs are aimed at improving the quality of education in Indonesia through collaboration with various international partners. (Denboba, A., Hasan, A., & Wodon, Q., 2015).

Denboba, Hasan, and Wodon (2015) emphasize the critical role of early childhood development in shaping long-term educational outcomes and national productivity. Their findings highlight that investment in foundational learning, particularly during the early years, significantly enhances a country's human capital and supports more equitable access to education. This underscores the importance of aligning Indonesia's international cooperation initiatives with policies that prioritize inclusive and quality early education, especially in collaborative programs aimed at capacity-building and educational equity.

One of the initiatives is the Indonesia-Australia Partnership for Basic Education (TAHURA) program, which focuses on improving the quality of basic education in Indonesia through teacher training, curriculum development, and infrastructure improvement. (ICR, 2016)

Additionally, the MoECRT has also established partnerships with other countries such as South Korea, Japan, and the Netherlands to promote early childhood education in Indonesia (Denboba, A., Hasan, A., & Wodon, Q., 2015).

Another program aimed at improving basic education in Indonesia is the USAID PRIORITAS program. This program focuses on improving teaching and learning practices in primary schools by providing training for teachers and school principals, improving classroom management, and promoting community engagement. The program has shown positive results in improving student learning outcomes and has been implemented in various provinces across Indonesia.

In the field of early childhood care and education, the MoECRT has also established partnerships with UNICEF and other international organizations to improve the quality of early childhood education in Indonesia. The program focuses on increasing access to early childhood education, improving the quality of early childhood education programs, and promoting parental and community involvement in early childhood education.

A range of educational initiatives have been implemented and are continuously being developed



under the close oversight of the Indonesian government. These programs have shown progressive advancement over the years, contributing to ongoing improvements in the quality of education and enhancing equitable access across different regions of the country.

In 2019, The Indonesian Ministry of Education, Culture, Research, and Technology (MoECRT) implemented a program to send 1,000 teachers abroad to enhance their professional knowledge and pedagogical skills. The program was intended to provide opportunities for Indonesian teachers to gain new insights and knowledge in various fields of education, including curriculum development, teaching methods, and educational technology. The program also aimed to enhance the capacity and quality of education in Indonesia by enabling the participating teachers to bring back their newly acquired knowledge and skills to their schools and share them with their colleagues.

The program was implemented in collaboration with various countries and educational institutions around the world, such as Australia, the United States, Japan, South Korea, and the Netherlands. The participating teachers were selected through a competitive process, which included assessments of their teaching performance and English language proficiency. The program provided various types of training, including short-term courses, workshops, and internships, depending on the needs and interests of the teachers.

The program was seen as a valuable opportunity for Indonesian teachers to improve their professional skills and competencies, and to foster international collaboration and cooperation in education. Through this program, the Indonesian Ministry of Education and Culture aimed to support the development of a more skilled and qualified teaching force, which could in turn help to enhance the quality of education and contribute to the development of the nation as a whole.

In 2020, out of the 13 state universities that received aid from the Directorate General of Higher Education, only 7 made it to the 1000 QS WUR ranking. Two private universities, the University of Muhammadiyah Surakarta and the University of Bina Nusantara, were also ranked. This means that a total of 9 Indonesian universities were represented in the QS WUR ranking. The Directorate General of Higher Education praised these universities for their strong commitment and effort to achieve this ranking, which is based on six indicators including academic reputation, employer reputation, faculty-student ratio,

international faculty, international students, and citations per faculty.

The following table below (see Table 2) describes the achievements of the ranking (position) of 13 state universities for 5 (five) years in QS WUR.

Table 2. Indonesian Universities International Rankings in QS World University Ranking year by year

No	Universities	2016	2017	2018	2019	2020	Ket
1	UI	325	277	292	296	305	↓
2	UGM	501 - 550	401-410	391	320	254	↑
3	ITB	401-410	331	359	331	313	↑
4	IPB	701+	751-800	701-750	601-650	531-540	↑
5	UA	701+	701-750	751-800	651-700	521-530	↑
6	UNPAD	-	-	651-700	751-800	801-1000	↓
7	ITS	701+	801-1000	801-1000	801-1000	751-800	↑
8	UNDIP	701+	801-1000	801-1000	801-1000	1000+	↓
9	UB	701+	801-1000	801-1000	1000+	-	↓
10	BINUS	-	-	-	801-1000	801-1000	↔
11	UMS	701+	801-1000	-	-	1000+	New entrance

Source: Ministry of Education, Culture, Research and Technology of The Republic of Indonesia, 2020

Indonesian universities continue to lag behind their regional peers in the QS World University Rankings (QS WUR), primarily due to low performance on key indicators such as academic reputation and citations per faculty member. The QS WUR assesses six core indicators, with the greatest weight assigned to academic reputation (40%) and citations per faculty (20%). Academic reputation is determined through a global survey of over 100,000 academics in the field of higher education, while citations per faculty are calculated based on the institution's academic publications indexed in Elsevier's Scopus database over the past five years.

For the 2020 ranking, QS evaluated approximately 138 million citations drawn from 18.5 million articles published between 2014 and 2018, with citation data extending to articles published as recently as 2019. This reliance on robust and globally recognized publication metrics places Indonesian universities at a disadvantage, particularly when compared with institutions in neighboring countries such as Malaysia, Singapore, and Thailand. A comparative analysis of the number of Scopus-indexed articles published by these countries from 2014 to 2019 is presented in the figure below to illustrate the gap in research output and citation performance.

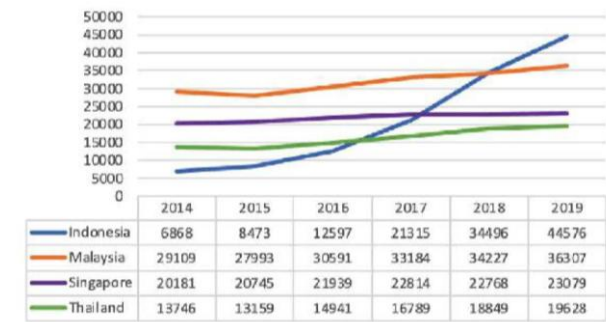


Figure 3. Number of Indonesian Academic Publication Compare to Different Countries  
Source: Ministry of Education, Culture, Research and Technology of The Republic of Indonesia, 2020

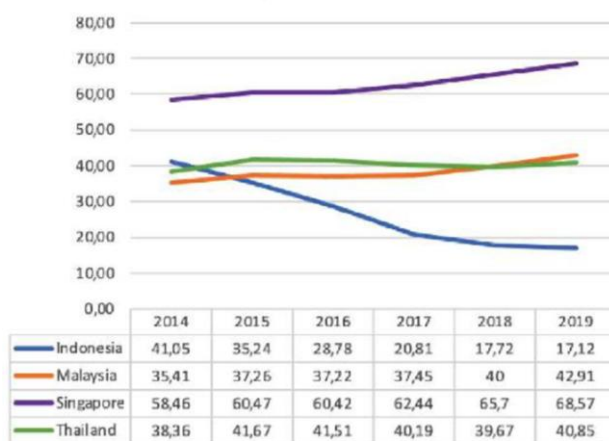


Figure 4. Percentage of International Collaboration of Indonesian Academic Publication Compare to Different Countries  
Source: Ministry of Education, Culture, Research and Technology of The Republic of Indonesia, 2020

Although the number of academic publications from Indonesia has shown a steady increase in recent years (Figure 3), the overall citation count remains relatively low compared to countries such as Malaysia, Singapore, and Thailand (Figure 4). This suggests that the primary challenge for Indonesian universities lies not merely in increasing publication volume, but in improving the quality, visibility, and international competitiveness of their research outputs. Figure 5 further indicates that citations to Indonesian publications tend to originate largely from within the country, highlighting limited global reach and engagement. Table 3 reinforces this trend by showing that even among Indonesia's top 13 universities, research output affiliated with the Scopus database still lacks strong citation impact. These findings underline the need for policies that not only promote research productivity, but also strengthen international collaboration, publication in

high-impact journals, and strategic dissemination to global academic audiences.

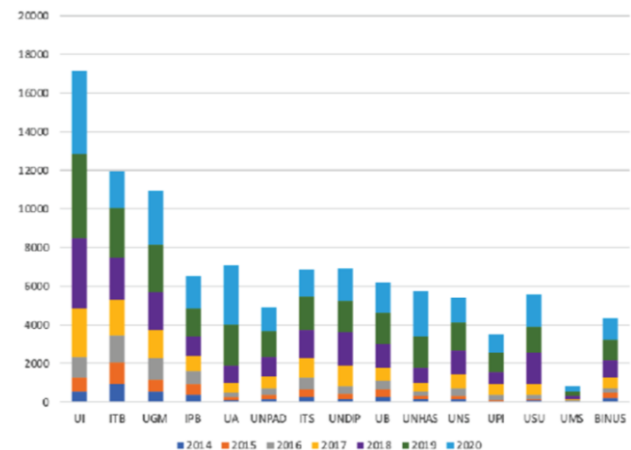


Figure 5. Number of Academic Publication on Indonesian Universities in Scopus 2014-2020  
Source: Ministry of Education, Culture, Research and Technology of The Republic of Indonesia, 2020

Table 3. Number of Citation Universitie in QS WUR 2018-2020

No	Universities	2018	2019	2020
1	UI	1.8	1.9	2.1
2	UGM	1.5	1.6	1.7
3	ITB	3.2	3.7	4

Source: Ministry of Education, Culture, Research and Technology of The Republic of Indonesia, 2020

Figure 5 and Table 3 indicate that the University of Indonesia produces the highest number of publications, while ITB has the highest citation count. However, a high publication count does not necessarily translate into a high citation rate, as the quality, relevance, and global visibility of publications play a critical role in increasing citations per faculty. To improve citation impact, Indonesian universities must prioritize strategies such as publishing in internationally recognized, high-impact journals; fostering interdisciplinary and cross-border research collaborations; enhancing academic writing and language quality; and engaging in open-access dissemination. Strengthening partnerships with reputable foreign institutions and participating in global research networks can also enhance the visibility and credibility of Indonesian research in the international academic community. Another indicator considered is the faculty/student ratio, which carries a weightage of 20%. This indicator measures the ratio of students to teachers and the number of teachers holding PhD qualifications. To assess this ratio,

Nanyang Technological University (NTU) in Singapore and the University of Malaya (UM) in Malaysia are selected as comparative benchmarks due to their strong regional reputation, consistent presence in the QS World University Rankings, and successful strategies in achieving high citation impact and research visibility. These institutions provide relevant reference points for evaluating the performance of Indonesian universities within a Southeast Asian context, particularly in terms of publication quality, international collaboration, and citation metrics, as shown in the table below.

Table 4. Students-Lecturers Ratio of Indonesian Universities

Compare to Different Universities Abroad Countries

Universities	Students	Lecturers	FSR
NTU	25,088	4,216	5.951
UM	15,140	2,464	6.144
UI	41,170	4,141	9.942
ITB	17,515	1,841	9.514
UGM	38,310	4,445	8.619
IPB	22,252	1,749	12.723
UNAIR	29,020	2,277	12.745

Source: Ministry of Education, Culture, Research and Technology of The Republic of Indonesia, 2020

Table 5. Number of Lecturers with Doctorate Degree of Indonesian Universities Compare to Different Universities Abroad Countries

Universities	Lecturers	PhD Staff	Score in QS Region	% PhD Staff
NTU	4,216	-	55.1	60.34%
UM	2,464	-	80.5	88.49%
UI	4,141	2,278	2.9	55.01%
ITB	1,841	1,191	41.4	64.69%
UGM	4,445	1,385	1.1	31.16%
IPB	1,749	1,423	74.3	81.36%
UNAIR	2,277	713	1.1	31.31%
ITS	1,265	395	1.1	31.20%

Source: Ministry of Education, Culture, Research and Technology of The Republic of Indonesia, 2020

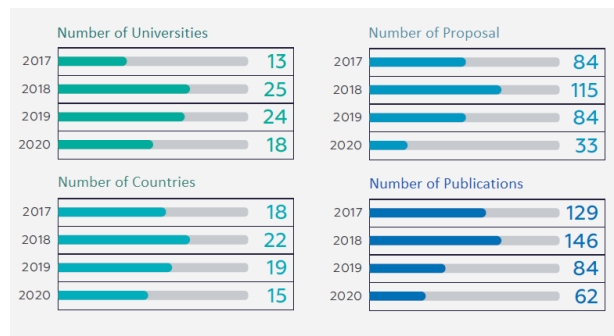


Figure 6. Figure of Statistics on World Class Professor Program 2017-2020

Source: Ministry of Education, Culture, Research and Technology of The Republic of Indonesia, 2020

Since its launch in 2017, the World Class Professor (WCP) program has generated a total of 475 joint publications, with a remarkable 330 articles published in Q1 journals, followed by 133 in Q2, 7 in Q3, and 5 in Q4 journals. This distribution reflects a strong emphasis on producing high-quality, internationally recognized research. Beyond academic publications, the WCP program has also contributed significantly to the broader development of Indonesia's higher education and research ecosystem. Its additional outputs include 15 scholarships that have supported academic mobility, 20 joint supervision arrangements that foster mentorship and capacity building, and 31 public lectures that enhance knowledge exchange. Moreover, the program has facilitated the creation of 4 new curricula, 13 memoranda of understanding (MoUs) formalizing institutional partnerships, and 10 research proposals that lay the groundwork for future collaboration. The production of 39 other publications and the organization of 14 academic seminars further demonstrate the program's role in strengthening international academic networks, building institutional capacity, and promoting Indonesia's presence in global research discourse.

In recent years, Indonesian universities have increasingly sought international collaborations to promote significant transformations in the country's higher education system. To facilitate such collaborations, the MoECRT (MoECRT) has launched several policies to foster partnerships between Indonesian universities and higher education institutions from other countries. These policies include the Matching Fund for Research and Academic Partnerships (Dana Padanan untuk Kemitraan Riset dan Akademik), the Visiting Scholars Program (Program Profesor Tamu), the Emancipated Learning Program (Kampus Merdeka), Indonesia International Student Mobility Award, and

Undergraduate and Graduate Scholarships, and Setting-up Presence in Indonesia, and the Certified Internship and Independent Study Program (Magang dan Studi Independen Bersertifikat, MSIB). These initiatives reflect the Indonesian government's commitment to strengthening higher education through increased collaboration, academic mobility, and experiential learning aligned with international standards.

The Matching Fund for Research and Academic Partnerships, for example, is aimed at promoting joint research projects between Indonesian and foreign institutions. The Visiting Scholars Program provides opportunities for international scholars to visit Indonesian universities and for Indonesian scholars to visit their international counterparts. The Emancipated Learning Program offers fully-accredited one-semester programs outside of the university campus. The Certified Internship and Independent Study Programs provide opportunities for Indonesian students to gain professional experience and engage in independent research in international settings. The Indonesia International Student Mobility Award provides scholarships for Indonesian students to study abroad, while the Undergraduate and Graduate Scholarships aim to attract international students to study in Indonesia. Finally, the Setting-up Presence in Indonesia policy aims to attract foreign universities to establish a presence in Indonesia, promoting greater institutional cooperation and knowledge exchange.

These policies are part of the Indonesian government's efforts to improve the quality of education and research in the country by leveraging international partnerships and collaborations. By providing opportunities for joint research, international exchange, and institutional partnerships, Indonesian universities can learn from and contribute to global knowledge networks, improving the quality and relevance of their education and research.

Number of Cultural Heritage and Museum 2018/2019

No	Province	Cultural Heritage	Museum
1	DKI Jakarta	150	64
2	Jawa Tengah	129	36
3	Banten	28	5
4	Jawa Timur	395	54
5	DI Yogyakarta	535	44
6	Jawa Timur	158	45
7	Aceh	33	9
8	Sumatera Utara	33	18
9	Sumatera Barat	181	18
10	Riau	25	9
11	Kepulauan Riau	173	3
12	Jambi	3	7
13	Sulawesi Selatan	9	5
14	Bangka Belitung	21	3
15	Bengkulu	58	2
16	Lampung	7	2
17	Kalimantan Barat	34	5
18	Kalimantan Tengah	3	2
19	Kalimantan Selatan	25	2
20	Kalimantan Utara	7	7
21	Kalimantan Timur	7	2
22	Sulawesi Utara	16	6
23	Gorontalo	8	1
24	Sulawesi Tengah	13	3
25	Sulawesi Selatan	51	16
26	Sulawesi Barat	8	4
27	Sulawesi Tenggara	5	3
28	Maluku	97	2
29	Maluku Utara	21	4
30	Irian Jaya	31	34
31	Nusa Tenggara Barat	11	4
32	Nusa Tenggara Timur	3	11
33	Papua	7	4
34	Papua Barat	1	1
<b>INDONESIA</b>		<b>2.319</b>	<b>435</b>

List of World Cultural Heritage Sites  
in Indonesia Stipulated by UNESCO  
2018

1. Borobudur Temple Compounds
2. Prambanan Temple Compounds
3. Sangiran Early Man Site
4. Bali Subak System: Manifestation of the Tri Hita Karana
5. Ombilin Coal Mining Heritage of Sawahlunto

The List of Intangible Cultural  
Heritage and the Register of Good  
Safeguarding Practices in Indonesia  
Compiled by UNESCO 2018

- Three genres of traditional dance in Bali
- Noken Bag
- Sarnan Dance
- Indonesian Angklung
- Indonesian Batik
- Education and training in Indonesian Batik intangible cultural heritage
- Indonesian Kris
- Wayang puppet theatre
- Pinisi – art of boat building in Sulawesi

Figure 7. List and number of Cultural Heritage and Museum in National dan International Level  
Source: Ministry of Education, Culture, Research and Technology of The Republic of Indonesia, 2020

In addition to its efforts in strengthening research and academic collaboration, the Indonesian Ministry of Education, Culture, Research, and Technology (MoECRT) also plays a critical role in the preservation and promotion of cultural heritage as an integral part of its international engagement strategy. Cultural diplomacy complements scientific cooperation by fostering mutual understanding and national identity on the global stage. One of the key avenues for this cultural engagement is MoECRT's active participation in UNESCO's cultural programs. Indonesia currently has several sites inscribed on UNESCO's World Heritage List, including the Borobudur Temple Compounds, the Prambanan Temple Compounds, and the Cultural Landscape of Bali Province. MoECRT is directly involved in the preservation, management, and international promotion of these heritage sites, ensuring they are maintained not only as symbols of Indonesia's rich history but also as shared global treasures.

In addition to its involvement with UNESCO's World Heritage program, MoECRT is also engaged in other international cooperation programs related to cultural heritage, such as the "ASEAN Cultural Heritage Digital Archive" project. This project aims to digitize and preserve cultural heritage objects from ASEAN countries, including Indonesia, and make them accessible to a wider audience.

Programs such as Indonesiana, Spice Routes (Jalur Rempah), and Darmasiswa are key instruments in Indonesia's cultural diplomacy strategy, reflecting the country's efforts to project its soft power globally. The Indonesiana program promotes the development of local arts and cultural festivals across Indonesia, which are then showcased internationally to represent the nation's creative diversity. The Spice Routes initiative revives and commemorates Indonesia's



historical maritime and trade networks, linking them to shared heritage with partner countries and fostering intercultural dialogue. Meanwhile, the Darmasiswa scholarship program invites international students to study Indonesian language, arts, and culture at various institutions across the country, strengthening people-to-people ties and raising awareness of Indonesia's cultural richness. Collectively, these initiatives enhance Indonesia's global cultural presence and support its broader foreign policy objectives through soft power engagement.

The "Spice Routes" program, on the other hand, is focused on promoting cultural and academic exchange between Indonesia and other countries along the historic Spice Routes. The program includes activities such as student and academic exchange programs, joint research projects, and cultural festivals. According to MoECRT, the Spice Routes program aims "to enhance mutual understanding and appreciation of cultural diversity, to promote academic and cultural cooperation, and to strengthen partnerships and collaboration among participating countries" (MoECRT, 2021).

The Darmasiswa RI Program is an Indonesian scholarship program for international students from various countries to study Indonesian language, art and culture (cooking, tourism) in higher education institutions of Indonesia for one year. The increase in the number of international students in Indonesia testifies to the confidence of the international world in Indonesia as a destination country for education. In Figure 8, the data of the Bureau for Cooperation and Public Relations shows the data of the Darmasiswa RI program from year to year.



Figure 8. Data on the number of participants in the Darmasiswa RI 1974-2020 program.

Source: Bureau for Cooperation and Public Relations, Ministry of Education, Culture, Research and Technology of The Republic of Indonesia, 2020

The Indonesian Language for Foreign Speakers (BIPA) is one of the forms of the transformation of the Indonesian language into an international language in the form of Indonesian language training

programs for foreigners and the expansion of linguistic and literary cooperation with foreign parties, as well as the development and expansion of opportunities for Indonesian language learning centers abroad. Figure 9 presents data on the appointment of Bahasa Indonesia untuk Penutur Asing (BIPA) teaching staff across various countries from 2015 to 2020. The steady increase in BIPA placements reflects the growing global interest in Indonesian language and culture, as well as the government's proactive efforts to expand linguistic and cultural outreach. This trend not only supports Indonesia's soft power strategy through language diplomacy but also contributes to strengthening bilateral relations, educational cooperation, and cultural exchange. The deployment of BIPA instructors plays a strategic role in building long-term engagement with foreign institutions, particularly in countries with significant student mobility and academic collaboration potential.

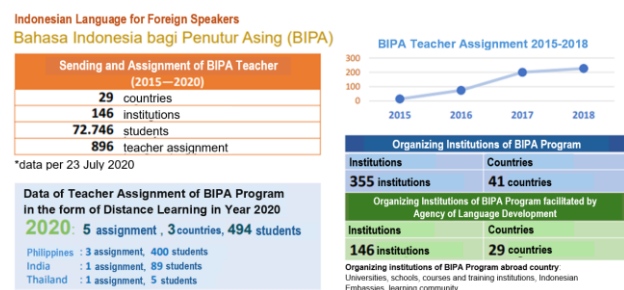


Figure 9. Data on the assignment of BIPA teaching staff for 2015-2020

Source: Agency for the Development and Development of Languages, Ministry of Education, Culture, Research and Technology of The Republic of Indonesia, 2020

The Indonesian government, through the Ministry of Education, Culture, Research, and Technology (MoECRT), facilitates the presence of international students by issuing study permits to foreign nationals enrolled in both formal and non-formal education programs. These permits serve as the administrative basis for obtaining residence permits issued by the Directorate General of Immigration under the Ministry of Law and Human Rights (Kemenkumham). In 2017, the number of international students studying in Indonesia reached 2,787 (MoECRT, 2020). While this figure reflects ongoing efforts to internationalize the education sector, it remains modest when compared to the number of Indonesian students studying abroad. To strengthen Indonesia's position as a regional education hub, more strategic policies are needed to attract foreign students—such as expanding the

availability of English-taught programs, increasing international scholarships, enhancing campus internationalization, and strengthening university partnerships abroad. Balancing inbound and outbound academic mobility is essential for fostering mutual understanding and reinforcing Indonesia's role in global knowledge exchange.

With regard to the student mobility program, the number of Indonesian students studying abroad continues to grow, demonstrating a form of internationalization of education and knowledge diplomacy. Based on data from the Ministry of Education and Culture (2011), Singapore became the largest in terms of the number of Indonesian students from 17 other countries with a total of 21,043 students.

From the above data, it follows that in order to maintain and improve the results and effectiveness of asset management, it is necessary to build up the institutional capacity of soft power diplomacy. Transformation is necessary to achieve higher performance and increase success in achieving organizational goals. Currently, there is no comprehensive approach to the management of diplomatic assets that allows us to anticipate the development of cooperation in the field of education and culture.

The management of other diplomatic assets is also reflected in the number of students and foreign workers in Indonesia. According to the Bureau of Cooperation and Public Relations, in 2016-2017, the number of foreign workers in Indonesia increased from 1,759 in 2016 to 4,217 in 2017. Meanwhile, Indonesia has seen a significant reduction in the number of international students, amounting to 4,171 in 2016 and 3,287 in 2017. It is fully shown in Figure 10.

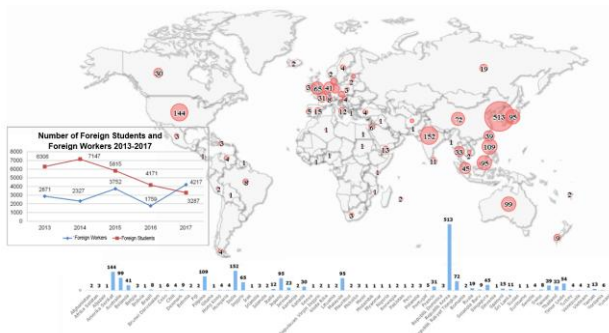


Figure 10. Number of students and foreign workers in the field of education in 2013-2017.

Source: Ministry of Education and Culture, 2020

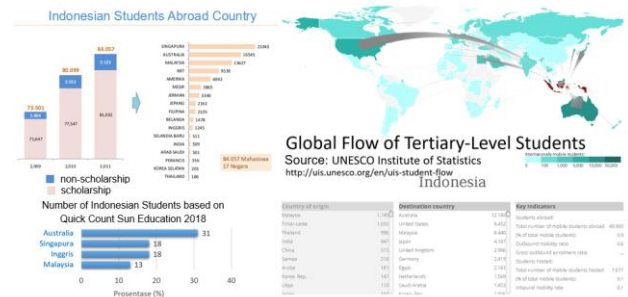


Figure 11. Global Flow of Tertiary-Level Students  
Source: UNESCO Institute of Statistics, Ministry of Education, Culture, Research and Technology of The Republic of Indonesia, 2020

In addition, there is a number of data on Indonesian students abroad from the Bureau of Planning and Overseas Cooperation, according to which 84,057 students are scattered across 17 countries. The significant difference in the number of international students in Indonesia and Indonesian students abroad is of great concern due to the fact that it is necessary to improve the efficiency of planning foreign cooperation in order to ensure a balance between the number of international students in Indonesia and Indonesian students abroad. Of course, in the hope of increasing the number of foreign students in Indonesia, Indonesia can become a place of study in the eyes of other countries. Therefore, there is a need for the scope and opportunities for foreign cooperation on the part of the Ministry of Education and Culture through the Bureau for Cooperation and Public Relations.



Figure 11. Figure and Facts on International Cooperation in the Ministry of Education, Culture, Research and Technology of The Republic of Indonesia

Source: Ministry of Education, Culture, Research and Technology of The Republic of Indonesia, 2020

Despite the efforts made by the Government, the country's education system cannot cope with the growing demand and risks facing a shortage of personnel. In particular, the demand for higher education is growing. So, if in 1990 1.5 million

students studied at public and private universities in Indonesia, then in 2009 more than 4.2 million (more than 3.5 thousand educational organizations). According to data published in The Jakarta Post, the shortage of specialists with higher education is already acutely felt at the middle level, and by 2020 the gap between supply and demand will be from 40 to 60%. The shortage of engineers is particularly acute. About 30 thousand of them are produced annually, but about 50 thousand are required to ensure economic growth. By 2025, this deficit may increase by more than 70%.

According to a study by HSBC bank "The Value of Education" : 42% of Indonesian parents believe that studying abroad will create prospects for their children's future careers; 31% are confident that foreign education will allow children to earn more; 67% hope that these goals will help to realize education within the framework of postgraduate programs. Preferences in areas of training are distributed as follows: 31% of parents think about teaching children abroad in medical specialties, 13% – in economics, 10% – in engineering, and 14% – in computer science.

According to the World Grad School Tour Applicant Survey – 2016, the main factors in deciding to study in a particular country for Indonesians are scholarship and financial support (62%), international recognition of qualifications (61%), cultural diversity (56%), improvement of language competencies (51%). The choice in favor of a particular university is significantly influenced by the reputation of the educational organization (42%), the cost of training (42%), employment prospects and career growth (22%). (QS Quacquarelli Symonds, 2016).

In this section, we discussed the various international cooperation programs initiated by the Ministry of Education, Culture, Research, and Technology of Indonesia. However, despite these efforts, the Ministry faces several limitations and challenges that can impede its ability to effectively engage in foreign cooperation. In the next section, we will delve deeper into the challenges and limitations faced by the Ministry in its foreign cooperation programs. We will explore issues such as insufficient funding, bureaucratic inefficiencies, language barriers, and limited infrastructure, and discuss how these challenges can hinder the Ministry's efforts to internationalize Indonesia's education system.

### **Challenges and Limitations of Foreign Cooperation Programs of Indonesia's Ministry of Education, Culture, Research, and Technology**

The Ministry of Education, Culture, Research, and Technology (MoECRT) plays a pivotal role in advancing Indonesia's educational and cultural development. While the Ministry has made commendable efforts to promote foreign cooperation and enhance institutional performance, it continues to face several limitations. Among these, the strategic integration of Business Intelligence (BI) remains a notable challenge. Despite its potential to improve decision-making and policy execution, insufficient investment in BI tools has constrained MoECRT's capacity to manage and leverage data effectively. For instance, the lack of a centralized and dynamic BI platform has hindered the Ministry's ability to monitor and analyze trends in inbound and outbound student mobility, track performance metrics of international partnerships, and evaluate the impact of scholarship programs in real time. In addition to BI-related gaps, MoECRT also grapples with bureaucratic inefficiencies, limited infrastructure, language barriers, and funding constraints—all of which can obstruct efforts to internationalize the education system. Addressing these systemic limitations, particularly by strengthening data-driven governance through BI, is essential for the Ministry to engage more effectively in international cooperation and elevate Indonesia's position in the global education landscape.

Table 6. Limitations and Problems Facing the Ministry of Education, Culture, Research, and Technology of Indonesia in Foreign Cooperation and Organizational Performance

	<b>Limitations/Problems</b>	<b>Description</b>
Technological and the use of BI limitations	Limited availability of data	The Ministry may lack sufficient data or access to data on international educational systems, cultural practices, and research and development in other countries. This can limit its ability to make informed decisions and effectively participate in foreign cooperation activities.
	Inadequate data	Inadequate data management systems, including outdated

Limitations/Problems		Description	Limitations/Problems		Description
Resource-related limitations	management systems	software and a lack of skilled personnel, can hinder the Ministry's ability to effectively collect, store, and analyze data.	Organizational and institutional limitations	Limited technological infrastructure	Limited technological infrastructure, including inadequate internet connectivity and outdated equipment, can hinder the Ministry's ability to participate in and benefit from foreign cooperation activities.
	Insufficient investment in Business Intelligence	Insufficient investment in Business Intelligence, including lack of funding and inadequate staff training programs, can limit the Ministry's ability to develop and implement effective Business Intelligence strategies.		Weak institutional structure	The institutional structure of the Ministry can be a hindrance in foreign cooperation, with unclear roles and responsibilities leading to confusion and inefficiencies.
	Resistance to change	Resistance to change from within the Ministry can hinder the adoption of new Business Intelligence practices and technologies, and limit the Ministry's ability to improve its foreign cooperation and organizational performance.		Limited monitoring and evaluation system	The Ministry lacks a comprehensive monitoring and evaluation system to assess the effectiveness of its foreign cooperation activities.
Resource-related limitations	Limited budget	Insufficient budget allocation for foreign cooperation activities can hinder the Ministry's ability to participate in international events and programs.	Sociopolitical limitations	Political instability	Political instability in Indonesia can affect foreign cooperation initiatives by creating uncertainty and hindering long-term planning.
	Limited staff capacity	The Ministry has limited capacity to manage and execute foreign cooperation activities due to a lack of experienced staff and inadequate training programs.		Uneven access to education	Access to education is limited in many parts of Indonesia, particularly in rural areas and among marginalized populations, leading to disparities in educational outcomes and hindering the country's development.
				Quality of teaching and learning	The quality of teaching and learning in schools remains a concern, with many teachers lacking



Limitations/Problems	Description
	the necessary skills and knowledge to effectively teach their students, and the curriculum not always being relevant to students' needs or adequately preparing them for the workforce.

Source: Developed by the author on the basis of reports of the MoECRT, E. Ziemba and C. M. Olszak, 2012, J. Ranjan, 2008, Shah., 2012, Xuemei Tian, et al., 2015, Cai, Li & Zhu, Yangyong, 2015.

Based on reports from MoECRT and key theoretical frameworks in Business Intelligence and information systems, aligning BI systems with organizational goals are important (Ziemba and Olszak (2012)). Ranjan (2008) also identifies core BI functionalities such as data mining, reporting, and performance management; supported by Shah (2012), who underlines the role of BI in enhancing strategic decision-making; Tian et al. (2015), who explore BI adoption challenges in public organizations; and Cai & Zhu (2015), who highlight the value dimension of information in supporting policy decisions. These frameworks were applied to analyze how BI systems can be operationalized within MoECRT, particularly in relation to international cooperation efforts, data governance, and institutional capacity-building.

The table lists several limitations that the Ministry of Education, Culture, Research, and Technology of Indonesia faces in the use of Business Intelligence (BI) for foreign cooperation and organizational performance. The limitations are grouped into resource-related, organizational and institutional, and sociopolitical categories. The resource-related limitations include a limited budget, staff capacity, and technological infrastructure. Organizational and institutional limitations include weak institutional structure and limited monitoring and evaluation system. Sociopolitical limitations include political instability, uneven access to education, and quality of teaching and learning. These limitations can hinder the Ministry's ability to effectively participate in foreign cooperation activities and improve its organizational performance.

## CONCLUSION

Strengthening Indonesia's international cooperation in education, culture, research, and technology requires a strategic commitment to institutional reform, technological advancement, and data-driven policymaking. Enhancing global engagement is not only essential for improving the quality of human capital but also for positioning Indonesia as a competitive, knowledge-based nation in the global arena. This goal can be achieved through three key pillars: addressing structural challenges and leveraging national potential, utilizing Business Intelligence (BI) for informed decision-making, and implementing forward-looking policy strategies.

Indonesia holds significant potential for international collaboration, supported by its cultural richness, strategic geographic location, and an expanding education sector. The government's modernization efforts and active partnerships with global institutions have laid a promising foundation. However, persistent challenges remain, including limited funding, bureaucratic inefficiencies, language barriers, infrastructure gaps, and uneven access to quality education. Broader socio-political issues such as political instability and disparities in teaching quality further complicate the landscape. These constraints must be systematically addressed to fully realize Indonesia's role in international education and research networks.

The integration of Business Intelligence (BI) can play a transformative role in overcoming these challenges. BI enables ministries and institutions to make informed decisions through real-time data analysis, performance monitoring, and predictive modeling. For example, BI can be used to track international student mobility, assess the impact of academic partnerships, and allocate resources more efficiently. Such tools not only improve internal governance but also enhance the transparency, accountability, and responsiveness of international cooperation initiatives.

Advancing Indonesia's global engagement demands strategic, cross-sectoral policy interventions. Collaboration among key stakeholders—including the Ministry of Education, Culture, Research, and Technology (MoECRT), other government agencies, higher education institutions, NGOs, and the private sector—is essential. Priority actions include investing in digital infrastructure, expanding English-medium academic programs, promoting outbound and inbound student mobility, and strengthening the capacity of universities to engage in high-impact international research. Establishing robust monitoring and evaluation

mechanisms will ensure that international cooperation efforts are sustainable, adaptive, and aligned with national development goals.

Indonesia's active participation in the global education ecosystem depends on its ability to transform challenges into opportunities through institutional innovation, technology integration, and collaborative governance. By aligning policies with global standards and investing in long-term capacity building, Indonesia can enhance its educational outcomes, contribute to sustainable development, and reinforce its strategic presence on the international stage.

In summary, Indonesia's ability to navigate the dynamics of globalization depends on its capacity to build robust international cooperation frameworks and effectively integrate Business Intelligence (BI) systems within public institutions like MoECRT. These tools are not merely supportive mechanisms—they are strategic enablers that can transform data into action, partnerships into progress, and aspirations into measurable outcomes. By strengthening institutional capacity, fostering data-driven decision-making, and deepening global academic and cultural partnerships, Indonesia can position itself not just as a participant, but as a leader in shaping a more inclusive, innovative, and sustainable global future.

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