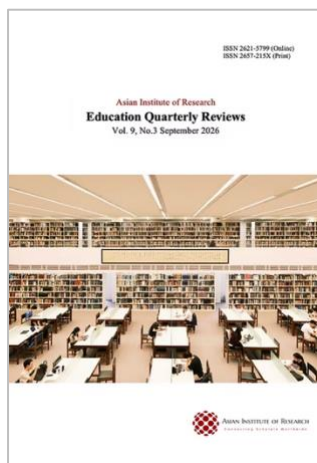




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Navigating Collaboration and Internationalization at Universitas Negeri Medan in the 21st Century

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Abstract

Internationalization and strategic collaboration have shifted from optional activities to essential tools for higher education institutions, aiming to maintain institutional relevance. Universitas Negeri Medan faces significant challenges in reconciling the traditional mandate as a former Teacher Training and Education Institute with the demands of competitive globalization. Therefore, this research aimed to analyze the dynamics, evaluate achievements, and map obstacles in collaborative governance at Universitas Negeri Medan, using data from 2020 to 2025. The results showed that based on internal data from the Office of International Affairs throughout the period, the university established 46 international Memoranda of Understanding and 112 Memoranda of Agreement, as well as 284 national MoUs and 742 MoAs. These partnerships contribute directly and linearly to the fulfillment of Key Performance Indicators, especially IKU-2, -3, -5, and -6. However, a critical analysis identified structural gaps, including bureaucratic obstacles, limited stimulus funds, and language barriers, that contribute to the low conversion ratio of macro MoUs into active MoAs at the research program level. These results contribute to an evidence-based policy recommendation model to minimize inequality. The evaluation also serves as a strategic basis for government agency performance reports, accelerating the quantum leap toward World-Class University status without abandoning local cultural wisdom.

Keywords: Internationalization, Collaboration, IKU, MoU-MoA, Universitas Negeri Medan

1. Introduction

The global higher education landscape in the 21st century is experiencing a structural transformation driven by globalization, digital interconnectivity, and the demands of integrating Society 5.0. Knowledge, innovation, and human talent are moving transnationally at an unprecedented pace. Universities can no longer function as ivory towers serving only the domestic market. Modern universities are required to transform into global innovation hubs, producing graduates with a global mindset and research with a significant impact on global humanitarian issues (Brilyanti, 2025). In a macro context, strategic collaboration and internationalization have shifted to become absolute necessities and core strategies for maintaining institutional relevance and competitiveness. A World Class University (WCU) is increasingly being defined by the breadth of the global partnership network, the mobility of ideas, and international recognition of the entire academic community. This phenomenon creates both pressure

and significant opportunities for Universitas Negeri Medan to reformulate the institutional development roadmap and remain relevant in an increasingly competitive global environment.

Universitas Negeri Medan, one of the leading state universities in western Indonesia, has a strategically important geopolitical position. This university, located in North Sumatra Province along the Strait of Malacca, is geographically close to vibrant Southeast Asian countries such as Malaysia, Singapore, and Thailand. The unique geographical traits provide Universitas Negeri Medan with a natural advantage as a gateway to the internationalization of education in this part of the archipelago. Moreover, the university has a rich historical legacy as the former Teacher Training and Education Institute (*Institut Keguruan dan Ilmu Pendidikan* [IKIP]). Although the mission extends beyond the production of non-teaching professionals in the 21st century, the university remains a crucial institution for training teachers. A fundamental challenge is how to reconcile the traditional role in teacher education with the demands of globalization. The educators and professionals being produced must be equipped to thrive in multicultural environments and embrace digital technologies across borders. Therefore, effective management of collaboration and internationalization is essential for the future success of Universitas Negeri Medan.

The acceleration of university partnerships during the first half of this decade is reflected in the growth chart of legal documents. Each page of the partnership agreement, especially the Memorandum of Agreement (MoA), is designed to drive progress toward the Key Performance Indicators for State Universities (*Indikator Kinerja Utama-Perguruan Tinggi* [IKU-PTN]). First, IKU-2 focuses on students gaining experience outside the campus. National MoAs cover the implementation of internship and teaching assistant programs in various educational institutions and industries in North Sumatra. Additionally, the international MoAs support credit transfer programs and student participation in the Indonesian International Student Mobility Awards (IISMA). Second, IKU-3 emphasizes lecturer engagement in activities outside the campus. The partnership document provides a legal framework for visiting and guest lecturers at partner universities abroad, or to work as practitioners and experts within government institutions, including the business and industrial sectors.

The research examined two further indicators. Third, IKU-5 pertains to how faculty can achieve international recognition through collaborative research initiatives. These partnerships lead to joint research and efforts that result in publications with leading global researchers in esteemed journals indexed by Scopus or Web of Science (WoS). The collaboration is essential, as it enhances global citation metrics. Fourth, IKU-6 emphasizes the importance of research programs developed in partnership with prestigious international institutions. By forming strategic alliances with top-ranked universities in the QS100-500 range, the curriculum can be updated according to Outcome-Based Education (OBE) standards. This restructuring aims to achieve international accreditation, including recognition from the Accreditation Board for Engineering and Technology (ABET), the Indonesian Accreditation Board for Engineering Education (IABEE), and the Accreditation Agency for Degree Programs in Engineering, Computer Science, Natural Sciences, and Mathematics (*Akkreditierungsagentur für Studiengänge der Ingenieurwissenschaften, der Informatik, der Naturwissenschaften und der Mathematik* [ASIIN]), along with the ASEAN University Network-Quality Assurance (AUN-QA).

Despite having a strong commitment through a Memorandum of Understanding (MoU), Universitas Negeri Medan is encountering several challenges in translating this commitment into an active Memorandum of Agreement (MoA). Several MoUs tend to remain at the ceremonial level without any actual follow-through at the program level. Some obstacles contribute to this situation. First, communication and bureaucratic gaps often limit coordination from the rector's office, specifically the Office of International Affairs (*Kantor Urusan Internasional* [KUI]) and the cooperation division, to the implementing units such as faculties and specific programs. Consequently, administrators may not fully grasp the scope of the MoUs that can be acted upon. Second, limited resources and funding for initiatives pose a significant barrier because actual activities, such as joint research or faculty exchanges, require substantial financial backing. The lack of sufficient internal funding makes it difficult for faculty members to independently pursue international collaboration. Third, language barriers and varying levels of readiness within the academic culture impede effective communication with international partners, thereby slowing the transformation of agreements into concrete collaborative programs.

This research has practical significance as an analytical foundation for preparing the performance report of Universitas Negeri Medan. As an institution operating under the Financial Management of Public Service Agency (*Pengelolaan Keuangan-Badan Layanan Umum* [PK-BLU]), directly accountable to the Ministry, Universitas Negeri Medan must demonstrate performance in an accountable, transparent, and evidence-based manner. This research underscores the importance of assessing partnership achievements not only through quantitative metrics but also by evaluating effectiveness in enhancing the quality of the “Three Pillars” of Indonesian Higher Education (*Tri Dharma Perguruan Tinggi Indonesia*): education and teaching, research and development, and community services. Analyzing the challenges in transitioning from MoUs to MoAs is a critical part of this gap analysis. The results provide recommendations to improve governance strategies in the upcoming year, as Universitas Negeri Medan strives to advance towards WCU status in the 21st century.

2. Theoretical framework

The theoretical framework serves as a conceptual foundation for dissecting, analyzing, and evaluating the dynamics of collaboration and internationalization in higher education, particularly at Universitas Negeri Medan. To build a robust analysis, this research integrates a triple-lens framework: (1) comprehensive internationalization, (2) future institutionalism in education, and (3) the resource-based view (RBV). These three theoretical perspectives are combined through the Quadruple Helix model to address the challenges of the collaboration and internationalization ecosystem in the 21st century. In this research, internationalization is conceptualized as a deeply rooted institutional commitment to embedding international, comparative, and global dimensions into the ethos, mission, and all functions of the Three Pillars of Higher Education. This approach is divided into two operational pillars, namely (1) internationalization abroad, which refers to the physical movement of students, faculty, research projects, and academic programs across national borders, and (2) internationalization at home (IaH), focusing on creating a multicultural campus ecosystem, integrating global perspectives into outcome-based education curricula, and using technology for virtual exchanges of all academics who do not participate in physical mobility (Hudzik, 2011; Soule, 2025).

The first theoretical approach is Hudzik’s (2011) concept of comprehensive internationalization, supported by the results from the sixth global survey of the International Association of Universities (IAU), which gathered data from 722 higher education institutions across 110 countries (IAU, 2024). Macro data show that 77% of universities worldwide considered internationalization to be of great importance (IAU, 2024). Interestingly, the main driver of this shift is not only commercial interests, such as recruiting high-paying international students, but rather the strategic necessity to connect globally with partner institutions and enhance institutional quality (IAU, 2024). From this perspective, Universitas Negeri Medan’s initiative to establish 46 international MoUs is a well-organized response to the evolving landscape of global interconnectivity.

The second theoretical approach is future-oriented educational institutionalism, which examines how higher education institutions adapt to address the complexities of the 21st century (Gidley, Hampson, Wheeler, and Bereded-Samuel, 2010a; Inayatullah and Gidley, 2000). The connection between theory and practice is demonstrated through institutional restructuring and shifts in educational paradigms. The current formal education model reflects the rigid, mechanistic structures of the industrial age, and should be replaced with postformal education that focuses on the evolution of consciousness, transdisciplinary curricula, and human-centered futures (Inayatullah and Gidley, 2000). In the sociology of education, institutionalism views the campus not merely as a learning environment, but an institution shaped by rules, norms, values, and social expectations (Gidley, Hampson, Wheeler, and Bereded-Samuel, 2010b). As a former Teacher Training Institution (*Lembaga Pendidikan Tenaga Kependidikan* [LPTK]), Universitas Negeri Medan has undertaken institutional reforms to remain relevant in an increasingly dynamic educational environment. Incorporating institutionalism theory can transform the institution from simply reproducing past knowledge into one that actively shapes the future. This transformation is essential for ensuring that graduates develop a forward-thinking mindset and are equipped to educate the new generation of the 21st century.

The third theoretical approach is the RBV, which is valuable for analyzing partnership governance and explaining how internal resources are managed to create sustainable competitive advantage (Barney, 1991; 2001). According

to RBV, resources that generate competitive advantage must meet four criteria of being valuable, rare, inimitable, and non-substitutable (VRIN). Within this framework, Universitas Negeri Medan does not aim to simply replicate the Western research university model but rather to leverage its unique strengths. As an LPTK, the university has comparative advantages in educational methodology, curriculum development, and character building. The slogan "*The Character-Building University*" is both a marketing phrase and a strategic resource from the RBV perspective. In the internationalization efforts, the university offers a character-based education model that is functional and infused with the local wisdom of North Sumatra. Furthermore, the RBV framework helps illustrate how Universitas Negeri Medan manages and transforms internal resources into significant bargaining power during international collaboration negotiations. In terms of partnership management, cooperation documents are categorized into two asset types. The first is MoUs, which represent potential resources with macro-legal value, but do not meet the VRIN criteria when unimplemented as "sleeping" MoUs. The second is MoAs, which refer to realized capabilities, such as those implementing a Scopus-indexed joint research scheme, an international class, or credit transfer. These initiatives subsequently evolve into dynamic capabilities that enhance the institution, IKU.

The three theoretical approaches are integrated into the Quadruple Helix model to address the collaboration and internationalization ecosystem in the 21st century. Collaboration in this century is no longer linear or limited to universities (Carayannis and Campbell, 2009). Within the framework of accelerating internationalization, Universitas Negeri Medan applies the dynamics of the Quadruple Helix model, stating that innovation and institutional progress arise from the synergistic interaction among four main actors, including academics, government at both the ministerial and regional levels, as well as industry or the private sector, and civil society (Carayannis and Campbell, 2009; 2012). In this theoretical narrative, the Quadruple Helix becomes a catalyst for strategic collaboration and internationalization programs, reflected as a mutually beneficial ecosystem network in which the university serves as a global knowledge hub for regional progress.

Global data indicate a significant structural gap in internationalization management. Research found that only 11% of public higher education systems worldwide have formal strategic plans and effective operational implementation for internationalization (Huang, Crăciun, and de Wit, 2022). Most successful internationalization resource absorption remains dominated by member countries of the Organization for Economic Cooperation and Development (OECD) (Crăciun, 2018). This pattern is reflected in internal data from Universitas Negeri Medan from 2020 to 2025, showing that 330 MoUs documents (46 international and 284 national) were reduced to 854 active MoAs (112 international and 742 national). From an RBV perspective, the conversion disparity stems from internal constraints such as limited research funding, language barriers, and campus bureaucracy that have not fully adapted to the culture of international collaboration.

This research integrates four conceptual perspectives to map the strategic direction of Universitas Negeri Medan as it navigates collaboration and internationalization in the 21st century. The core of the transformation is driven by the comprehensive internationalization paradigm, emphasizing that internationalization is not only a supplementary program but a comprehensive institutional commitment permeating all aspects of the Three Pillars of Higher Education, from governance to campus culture. The acceleration of this global vision is contextualized through the perspective of future educational institutionalism, which positions Universitas Negeri Medan as an institution adaptive to the disruptions of the times, capable of reforming rigid bureaucratic structures to anticipate future educational trends based on digitalization and curriculum flexibility. To compete internationally without losing identity, Universitas Negeri Medan implements the RBV strategy to identify, manage, and capitalize on valuable and unique internal assets that are transformed into competitive advantages in the global market. The governance of these resources is actualized through the Quadruple Helix ecosystem that integrates the active roles of academia, government, industry, and society in a synergistic innovation network. Through this synthesis, internationalization is understood as a complete strategic movement driven by a comprehensive commitment, oriented towards institutionalism, based on internal character strengths (RBV), and manifested through the Quadruple Helix.

3. Method

Navigating collaboration and internationalization at Universitas Negeri Medan in the 21st century requires an approach that not only captures surface data but also delves into the realities underlying the processes. Therefore, this research applies a mixed-methods approach, a scientific work procedure that combines quantitative and qualitative methods in a single investigation (Creswell and Creswell, 2018). The decision to use mixed methods is based on the argument that a single method is not sufficient to capture the complexity of the dynamics related to higher education internationalization. By integrating these two methods, the inherent biases of each approach can be minimized, resulting in a more valid, objective analysis with a high level of applicability for policymakers. This research specifically adopted an explanatory sequential design (Creswell and Creswell, 2018), which operates in two separate but mutually reinforcing chronological phases. The essence of this design is to use qualitative data to clarify, deepen, and contextualize the quantitative results obtained in the initial phase. In the first phase, the research started with a quantitative approach focused on macro-mapping the extent to which comprehensive internationalization indicators and Quadruple Helix ecosystem involvement have been realized at Universitas Negeri Medan. Numerical data were collected through the distribution of structured Likert-scale questionnaires to a representative sample of respondents, including program leaders, lecturers, KUI staff, and students involved in global mobility programs.

The collected quantitative data were then analyzed using descriptive statistics to determine the percentage of achievement and using inferential statistics to examine structural relationships among variables, such as how institutional governance capacity influences the success of international partnership programs. Table 1 shows a matrix of empirical indicators that integrates the four theoretical foundations into a research instrument for the context of Universitas Negeri Medan.

Table 1: Empirical matrix of research instruments

No	Theoretical Basis	Dimensional Variables	Indicators	Questionnaire items	Interview Focus
1	Comprehensive internationalization	Curriculum and Global Learning	Integration of a global perspective into the syllabus	1,2,3	Curriculum alignment strategies.
		Academic Mobility	International or bilingual classes	4,5,6	Barriers to internationalization abroad and the solutions.
		Campus Policy and Culture	Relevance to international accreditation	7,8	Internalizing a global vision within the work culture.
2	Institutionalism in the Future of Education	Regulatory Flexibility and Adaptability	Campus regulations governing the conversion of international courses, including the speed of bureaucratic responses to global partnerships.	9, 10	The process of transforming the governance of State Universities into Legal Entities and simplifying bureaucracy.
		Digitalization and Future Infrastructure	Readiness of a globally standardized learning management system (LMS) platform and the accessibility of supporting digital infrastructure (virtual mobility).	11, 12	Digital infrastructure readiness to support the hybrid education trend.
3	RBV	Uniqueness of Organized Identity	"The Characters Building University" has a partnership advantage, including unique teaching methodologies.	13, 14	How to package the excellence of character education to attract foreign university partners.

		Capitalization of Local Wisdom	Integration of multiculturalism into global research products and recognition of locality by the international academic community.	15, 16	Optimizing local wisdom assets as a differentiator from other research universities.
4	Quadruple Helix Ecosystem	Synergy Between Academics and Government	Funding and regulatory support for international programs and contributions of expertise to regional development policies.	17, 18	Effective use of government grants to promote international recognition.
		Partnerships with Industry and the Community	Involvement of multinational companies in curriculum design and internships, as well as the downstreaming of international research to address civil society issues.	19, 20	The challenge of aligning global industry expectations with academic research achievements at Universitas Negeri Medan.

The quantitative analysis results obtained from the first phase serve as a bridge to the second phase, namely the qualitative approach. The numbers and trends discovered in the first phase often leave open the questions of "why" and "how." This is where qualitative methods explain the underlying mechanisms of the numerical data. Using a purposive sampling technique, researchers identified key informants, including the Rector, the Vice Rector for Cooperation, the Head of KUI, and foreign industry partners, to participate in in-depth interviews and focus group discussions (FGDs). The qualitative process uncovered the realities behind the numbers, including the psychological and cultural barriers lecturers face when teaching international classes, the bureaucratic challenges in converting course grades, as well as strategies for packaging the identity of "The Character Buildings University" to appeal to global partners.

The final phase of this method is the integration of both types of data in the analysis and discussion. Researchers juxtapose quantitative data visualizations, such as tables or diagrams, with narrative excerpts from qualitative interviews. Therefore, the final interpretation not only presents the status of internationalization achievements statistically but also offers a tactical roadmap and applicable solutions rooted in the real conditions of organizational culture in the 21st century. To ensure the quality, validity, and accuracy of the results of this mixed-methods research with an explanatory sequential design, data validation techniques are divided into three main stages, namely quantitative, qualitative, and integration.

Quantitative data validation emphasized subjecting the instrument to a series of scientific trials to ensure accuracy and consistency, including content and construct validity, as well as reliability. Meanwhile, qualitative data validation, designed to ensure the validity of verbal and textual data obtained from interviews and focus group discussions, emphasizes source triangulation, technical triangulation, member checking, external validity, and reliability (Guba and Lincoln, 1994). Finally, mixed methods validity ensures that the selection of qualitative informants in the second phase is truly based on the statistical results of the first phase, such as selecting research programs with the highest and lowest internationalization achievements based on questionnaire scores and sample consistency. It ensures that qualitative informants are part of or an extension of the quantitative population in the first phase to avoid bias due to differences in case backgrounds. This research was conducted from 2024 to 2025, with a relatively long duration to strengthen the validity of the data in formulating collaboration and internationalization policies at Universitas Negeri Medan.

4. Results

Based on a summary of internal data from the KUI and the Cooperation Section at the Office of the Vice Rector for Cooperation, Public Relations, and Information Systems at Universitas Negeri Medan, a collection of MoUs and MoAs partnership documents signed between 2020 and 2025 is presented. Table 1 shows statistics on legal documents for collaborations between 2020 and 2025.

Table 1: Statistics of legal documents for collaboration with Universitas Negeri Medan, 2020-2025

Region and Document Type	Active Cumulative, 2020-2025	Related Partnership Clusters/Related Institutions
International MoU	46 Documents	Universities in the ASEAN region (Malaysia, Thailand), Taiwan, Pukyong National University (Korea), Australia, France, Germany, and Arizona State University.
International MoA	112 Documents	Research consortia, credit transfer programs, and transnational lecturer exchanges.
National MoU	284 Documents	Ministries, Regional Governments in North Sumatra, State-Owned Enterprises, and Non-Governmental Organizations.
National MoA	742 Documents	Creative Industry Partners, MBKM (Freedom to Learn - Independent Campus) Partner Schools, and Teacher Training Centers.

Source: Office of the Vice Rector for Cooperation, Public Relations, and Information Systems, Universitas Negeri Medan, 2026.

Historical data from 2020 to 2025 show a very positive trend, with Universitas Negeri Medan not only increasing the number of MoUs but also encouraging a rise in the number of MoAs, indicating a real commitment to action at the faculty and program levels. Furthermore, the data demonstrates the extensive network of partnerships. However, the main challenge is no longer simply increasing the number of signatures on paper, but rather optimizing the use of each agreed-upon collaboration document. Data on active partnerships in the form of MoUs and MoAs at the faculty level show a distribution of portions consistent with the focus of the IKU-6, namely, program partnerships. Table 2 shows the cumulative distribution of active national and international collaboration documents per faculty throughout 2020-2025.

Table 2: Distribution of Collaboration per Faculty, 2020-2025

Faculties	Collaboration		Key strategic partners, domestic and global
	National	International	
Faculty of Languages and Arts	65	14	United States Consulate, German Consulate, French Consulate, Universiti Sains Malaysia, Goethe-Institut, North Sumatra Language Center.
Faculty of Mathematics and Natural Sciences	70	12	Kyushu Institute of Technology, Japan, Kasetsart University, Thailand, and the National University of Malaysia.
Faculty of Economics and Business	85	16	University of Sains Malaysia, National University of Malaysia, PT Bank Sumut, and Financial Services Authority.
Faculty of Engineering	95	8	State Electricity Company, Toyota Astra Motor, Vocational Training Centers, and Vocational High School partners.
Faculty of Education	110	7	Provincial/City Education Offices, Bina Guna Sports College, Pembina Laboratory School.
Faculty of Social Sciences	55	5	National Land Agency, Central Statistics Agency, Regional Museums, General Election Commission, and Culture and Tourism Office.
Faculty of Sports and Health Sciences	50	4	Ministry of Youth and Sports, Indonesian National Sports Committee, Asahan University.

Faculty of Medicine	12	0	Bhayangkara Hospital, Hajj Hospital, Tebing Tinggi Regional Hospital, and Adam Malik Hospital.
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Source: Office of the Vice Rector for Cooperation, Public Relations, and Information Systems, Universitas Negeri Medan, 2026.

Overall, the partnership data by faculty show that the internationalization agenda has progressed across all academic disciplines. Science and business clusters focus on global commercial innovation, while the humanities cluster emphasizes maintaining performing arts and ethnic literature on the regional stage. Based on the annual trend visualization, the dynamics of national and international collaboration data show a very strong recovery pattern (exponential growth) that divides the timeline into two main phases. The first is the pandemic phase, spanning 2020-2021, which reflects regulatory pressure and retraction. During the pandemic, the collaboration graph reflects the nadir of global macro partnership activity, with the number of active international MoUs decreasing to 12 at the start of the pandemic and further shrinking to 8 partnerships in 2021. The causes were large-scale international travel restrictions (lockdowns), restrictions on physical mobility, and a shift in the university budget focus to fulfill emergency online learning infrastructure. The second is the post-pandemic acceleration phase, 2022-2025, which reflects a surge based on the IKU. In 2022, there was a turning point, and with the reopening of international borders, the graph immediately jumped significantly to 19 partnerships through the initiation of hybrid international mobility programs.

From 2023 to 2024, the number of partnerships rose sharply from 32 to 48. The triggers were national scholarship programs such as IISMA and the aggressive pursuit of IKU by faculties (Languages and Arts through the US Consulate and the Faculty of Economics with Universiti Malaya) to pursue the achievement of IKU. Finally, in 2025, the peak achievement of cumulative international partnerships reached 65, marked by a substantial inflow of foreign research and the hosting of cross-continental scientific media, such as international forums initiated by the Faculty of Languages and Arts. The turning point and peak were inseparable from leadership changes at Universitas Negeri Medan at the end of 2023, where the Vice Chancellor for Cooperation, Public Relations, and Information Systems was entrusted by the Chancellor and Chair of the Senate to Erond L. Damanik, a Professor from the Faculty of Social Sciences.

During the Vice Chancellor's tenure, the university successfully established international partnerships with campuses and institutions such as Pukyong National University, South Korea, Arizona State University, United States Agency for International Development (USAID), Le Havre University, France, and Freie Universität Berlin, Germany, as well as 13 QS 200 campuses in Malaysia. The aggressiveness in pursuing the WCU target facilitated a significant increase in the number of lecturers working at top world universities, supported by prestigious scholarship schemes, including Fulbright and internal institutional funds. Short-term guest lecture programs, filled by young and senior lecturers, were held at international-class forums managed by foreign universities, both bilaterally and within regional consortia, throughout 2023-2025. Figure 1 shows the growth trend in international partnerships from 2020 to 2025.

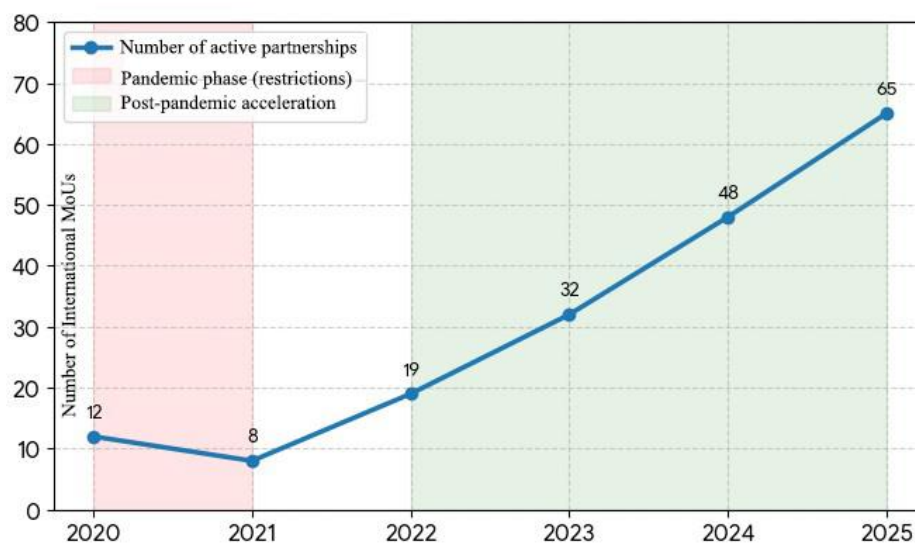


Figure 1: Trends in international collaboration at Universitas Negeri Medan from 2020 to 2025

Source: Office of the Vice Rector for Cooperation, Public Relations, and Information Systems, Universitas Negeri Medan, 2026

Overall, this comparison demonstrates that Universitas Negeri Medan's collaboration and internationalization strategy achieved a full (V-shaped) recovery post-pandemic, transforming the global restriction crisis into opportunities to expand the campus collaborative network in the 21st century. A tangible component of this collaboration is evident in the increase in the Scopus publication index from 2020 to 2025, which shows a strong linear correlation with the expansion of the international collaboration graph. When macro partnership restrictions were lifted post-pandemic, the impact immediately drove the global research output of the academic community exponentially. Table 3 shows a specific comparative analysis that maps the dynamics of Universitas Negeri Medan Scopus publications alongside the previous collaboration growth graph.

Table 3: Correlation of Active MoUs with Scopus-indexed article volume, 2020-2025

Analysis Period	Average International Partnership	Annual Scopus publication volume	Collaboration Characteristics and Research Impact
Pandemic Era (2020-2021)	8-12 Partners	~110-140 articles/year	Dominated by local independent publications or domestic conference proceedings with low citation impact.
Post-Pandemic Era (2022-2023)	19-32 Partners	~220-350 articles/year	The rise of hybrid research in co-authorship formats with researchers in ASEAN.
Excellent Acceleration Era (2024-2025)	48-65 Partners	~480-620 articles/year	The surge is dominated by journals published in Q1–Q4 and by proceedings from globally reputable publications, particularly IEEE.

Source: Office of the Vice Rector for Cooperation, Public Relations, and Information Systems, Universitas Negeri Medan, 2026

The acceleration of the publication graph from 2023 to 2025 was driven by three strategic policy interventions by the rectorate. The first is the strict regulations of the Research and Community Service Institute, where the latest policy requires all International Collaborative Research schemes funded by internal funds to produce mandatory outputs in the form of articles accepted in at least Reputable International Journals, Scopus Quartile 4, or Web of Science (WoS). The second intervention is internationalization of co-authorship, where, through active partnerships with campuses such as Universiti Sains Malaysia (USM) and Kasetsart University, lecturers of Universitas Negeri Medan are involved in joint research schemes. This collaboration breaks the deadlock in penetration into international journals by using laboratory networks and joint funding. The third is a publication-based graduation policy that provides incentives and encouragement for outstanding students to convert the results of final project research into Scopus-indexed international proceedings. Figure 2 is a graph of the cumulative distribution of Scopus articles by quartile throughout 2020-2025.

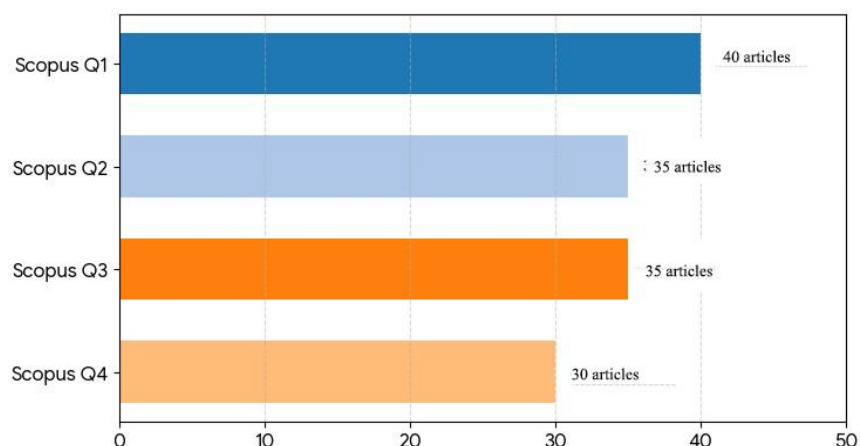


Figure 2: Scopus Articles by Quartile from 2020 to 2025

Source: Office of the Vice Rector for Cooperation, Public Relations, and Information Systems, Universitas Negeri Medan, 2026

The graph above empirically demonstrates that Universitas Negeri Medan's academic transformation in the 21st century no longer relies on the quantity of mass-market articles (non-Quartile) but has instead shifted toward publishing in high-impact journals. This shift is evident in both quantity and quality, as reflected in the Scopus index from 2020 to 2025. The period of 2020-2021 focused solely on publications on conventional, local-scale education topics indexed by Sinta or in non-Scopus proceedings, while 2024-2025 showed a diversification of research clusters toward Artificial Intelligence in Education, gamification, digital-based ethnic culture, and pure science. Co-authorship with international researchers strengthened the university's scientific visibility, marked by a significant increase in citedness within the Scopus database for journals managed internally by the institution, such as the Journal of Geography in the Faculty of Social Sciences.

Based on reporting data for the IKU-3, namely lecturers engaged in off-campus activities, as well as records of international partnerships at Universitas Negeri Medan throughout 2020-2025, data on guest lecturers, visiting professors, and visiting lecturers abroad were obtained, showing fluctuations closely correlated with the transition from the pandemic to the post-pandemic acceleration era. Cumulatively, the estimated total teaching assignments and invitations for lecturers to partner universities abroad, both online/hybrid during the pandemic and fully physical post-pandemic, amounted to about 35 to 45 assignments. During the pandemic phase throughout 2020-2021, only around 5-8 assignments were carried out online. Restrictions on global physical mobility (lockdown) shifted teaching activities abroad to digital platforms. Universitas Negeri Medan leveraged regional relations in Southeast Asia to continue sending lecturers to teach in overseas classes virtually. The transition and recovery phase throughout 2022-2023 increased the number of assignments to 12-15, along with the opening of international borders, exchange programs, and the revival of physical teaching. Universitas Negeri Medan lecturers were increasingly invited back to universities in Malaysia, Thailand, and Taiwan as the joint-curriculum program expanded. The global acceleration phase of 2024-2025 increased the number of assignments to 18-22, marking the peak of the institution's performance.

Collaboration-based income generation, both national and international, at Universitas Negeri Medan from 2020 to 2025 is managed centrally through the Public Service Agency (BLU) Non-Tax State Revenue (PNBP) mechanism. As a BLU-status university, Universitas Negeri Medan does not rely solely on student tuition fees (*Uang Kuliah Tunggal* [UKT]) but actively maximizes commercial institutional collaborations that generate non-academic income. Collaboration-based income generation from 2020 to 2021 reached IDR 2.5 billion to IDR 3.5 billion per year, with collaboration income experiencing a drastic decline due to the cancellation of various physical lease contracts, face-to-face training, and domestic industrial field projects. The majority of income was supported by digital project work, independent contract research, and online laboratory testing services of limited value. Post-pandemic income generation from 2022 to 2025 reached IDR 6 billion to IDR 11 billion by the end of 2025. This increase was driven by the commercialization of campus assets, large-scale industrial internship programs, and increased research grants from international institutions.

5. Discussion

The 21st century has fundamentally reshaped the global higher education landscape. Education is no longer limited by geographical boundaries and increasingly demands the fluid exchange of information, technology, and cultural dynamics. For Universitas Negeri Medan, this dynamic is an external challenge as well as a historic call to redefine purpose. Guided by the grand vision of excelling in education, industrial engineering, and culture, Universitas Negeri Medan recognizes that the key to maintaining relevance in this era is grounded in two strategic pillars, namely macro-collaboration and accelerated internationalization. Navigating the institutional direction amid the currents of modernization requires a strong but also adaptive blueprint. Through curriculum transitions, strengthening the quality of human resources, and establishing a network of partnerships across continents, the university is gradually being transformed. From a regional university in North Sumatra, Universitas Negeri Medan has grown into a powerhouse of innovation to be reckoned with on the global stage, steadily moving toward WCU status.

The fundamental steps toward navigating the 21st century must start from the classroom. The rector emphasized the need to produce graduates who not only master theory but also demonstrate high adaptability, creativity, and solution-oriented skills to address the complexities of the modern workplace. A concrete manifestation of this directive is the comprehensive implementation of an Outcome-Based Education (OBE) curriculum across the eight faculties. The OBE approach shifts the focus of education from what lecturers teach to what students are able to achieve upon graduation. To ensure this competency is globally recognized, Universitas Negeri Medan is committed to periodically standardizing the quality of services and programs through international accreditation. This step is complemented by achieving the Excellence Accreditation designation. The recognition demonstrates that the academic quality, curriculum, and assessment system are comparable to those of leading educational institutions worldwide.

As a leading teaching and research institution, Universitas Negeri Medan does not allow academic investigations to be isolated within the campus library. Navigating the 21st century demands high-impact research through international collaboration. This synergy is driven largely by various faculties, particularly through scientific clusters. One remarkable example is the international collaborative research involving the Faculty of Education, Semarang State University, and Kasetsart University, Thailand. The strategic project, funded by the Institute of Research and Community Service (LPPM) through the International Collaborative Research scheme, produced cutting-edge, technology-based instruments and platforms to optimize science and geometry learning at the elementary school level. In the social and economic cluster, the Faculty of Economics is taking aggressive steps by strengthening its international network through a strategic collaboration with Universiti Kebangsaan Malaysia (UKM). The Undergraduate Program in Economics at the Faculty of Economics is also actively implementing International Community Service (*Program Kemitraan Masyarakat* [PKM]). This cross-border collaboration provides opportunities for Universitas Negeri Medan lecturers and researchers to absorb global best practices, exchange perspectives, and publish innovations in internationally reputable journals.

Internationalization extends beyond cooperation documents to the development of an ecosystem that fosters a global mindset across the entire academic community. Universitas Negeri Medan consistently sends students and lecturers to participate in prestigious international mobility programs, including national partnership scholarship programs such as the Indonesian International Student Mobility Awards (IISMA). Through this platform, students from various faculties, including the Faculty of Languages and Arts and the Faculty of Engineering, have the opportunity to study abroad at world-class partner universities. The tangible impact of this global ecosystem is evident in the outcomes of the alumni. Two alumni from the Computer Science Study Program, Angga Warjaya and Sri Mulyana, have successfully passed the international academic selection to continue their master's studies at the Kyushu Institute of Technology in Japan. In addition, the presence of foreign students studying at Universitas Negeri Medan also creates an atmosphere of Internationalization at Home. This daily cultural and academic interaction indirectly trains local students to develop high tolerance, cross-cultural communication skills, and broad worldviews.

Navigating internationalization cannot be robust without strong domestic roots. The university recognizes that global progress must be supported by strong local contributions. This realization has led to consistent expansion of a collaborative network with various universities, local governments, and the domestic industrial sector. For example, the Faculty of Sport Science has established a strategic interdisciplinary partnership with the Faculty of Agriculture at Asahan University (*Universitas Asahan* [UNA]). This unique collaboration brings together expertise in fitness and the agricultural sector to examine crucial issues regarding student mental health and well-being. The collaboration demonstrates the university's ability to view challenges holistically. To produce great scientific and technological innovations in the 21st century, the primary foundation is the psychological well-being and mental readiness of the young generation.

The sustained efforts of faculty at all levels to navigate this collaboration and internationalization have produced significant, concrete results. First, increased credibility for graduates across fields, both educational and non-educational. For example, the Faculty of Social Sciences has demonstrated strong job absorption because graduates are equipped with global competencies. Second, quality management driven by the rectorate and deans has succeeded in converting institutional accreditation (which previously had an A predicate) into a leap in

accreditation of programs with "Excellent" status on the national and international stage. Third, the expansion of international research collaboration has contributed to global publications and citations. Joint research with top campuses in Southeast Asia has increased the number of scientific publications by Universitas Negeri Medan lecturers in reputable international journal indexes such as Scopus.

All achievements in collaboration and internationalization from 2020 to 2025 are inseparable from the leadership of Baharuddin, the Rector of Universitas Negeri Medan, who developed an academic blueprint through a robust theoretical foundation. The concrete implementation of this vision is comprehensively analyzed through a triple-lens framework comprising comprehensive internationalization, the future institutionalism of education, and RBV, all organically integrated into the Quadruple Helix innovation model. This multidimensional synergy has successfully transformed Universitas Negeri Medan from a regional university in North Sumatra into a competitive innovation powerhouse on the global stage, while also demonstrating that global expansion can be achieved without uprooting local cultural identities.

The first perspective, comprehensive internationalization, views global orientation not ordinarily as a ceremonial activity on paper but as a commitment integrated into the entire three pillars of higher education. Concrete manifestations include the shift to an OBE-based curriculum across eight faculties and the attainment of excellent accreditation for various study programs. This global atmosphere is reflected in Internationalization at Home, where students receive digital language testing infrastructure from the Language Technical Implementation Unit (UPT Bahasa) before entering international scholarship programs such as IISMA. The effectiveness of this approach is evidenced in the success of Computer Science alumni from the Faculty of Mathematics and Natural Sciences, Angga Warjaya and Sri Mulyana, who successfully passed the academic selection to continue their master's directly at Kyushu Institute of Technology in Japan.

The second perspective, institutionalism of the future of education, emphasizes Universitas Negeri Medan's agility in adapting to regulatory pressures and global environmental expectations to maintain institutional legitimacy. The surge in international partnerships, from 12 during the pandemic (2020) to 65 active partnerships post-pandemic (2025), represents a strategic response to achieving IKU-6. In this context, the Faculty of Languages and Arts plays a central role by organizing the International Seminar on Language, Arts, and Literature Education (ISLALe 2025). Through this intercontinental scientific platform, the Faculty of Languages and Arts successfully leveraged digital technologies, such as artificial intelligence and gamification, as institutional instruments to redefine the teaching of Malay ethnic literature and arts, ensuring they remain relevant and sought after by Generation Z internationally.

The third perspective, RBV, emphasizes that international competitiveness is largely determined by optimizing valuable and unique internal assets as core competencies. The expertise of senior academics who received Fulbright Visiting Scholar awards in 2024 to the United States or who served as Faculty Ambassadors at Universiti Sains Malaysia (USM) constitutes the primary capital in the joint research scheme. This intellectual excellence is translated into economically valuable products, helping Universitas Negeri Medan rank among the Top 10 Universities with the Most Copyright Applicants in Indonesia in 2025. As a BLU legal entity, research, downstreaming, and asset commercialization can generate income ranging from IDR 9 billion to IDR 11 billion per year. These non-UKT funds are reinvested to finance publication incentives for top-quartile Scopus journals (40 Q1 articles and 35 Q2 articles), creating a sustainable cycle of asset growth.

All the achievements of these three perspectives are consistent with the Quadruple Helix model, which integrates four main pillars. Universitas Negeri Medan, as a higher education institution, serves as a research dynamo and a producer of global talent. Meanwhile, the government provides a regulatory umbrella and strategic reinforcement, such as the collaboration between the Faculty of Sport and Health Sciences and the Ministry of Youth and Sports to develop national sports science, and the Universitas Sumatera Utara sponsorship of the Faculty of Medicine. The industry, as the third pillar, strengthens the university finances through internships and domestic commercial projects, including collaborations with five state-owned banks. Meanwhile, local communities ensure that internationalization remains grounded in the cultural values and traditions of North Sumatra. The interaction

among these four sectors illustrates how the Quadruple Helix model has supported the university's internationalization while preserving regional identity.

The success of Universitas Negeri Medan in navigating collaboration and internationalization in the 21st century is not only a statistical achievement but a structural transformation driven by a fresh academic paradigm. By synthesizing the triple-lens framework and the Quadruple Helix model, the university developed a well-established strategy. This approach formed a conceptual novelty, a fusion of cultural glocalization and modern technology. Universitas Negeri Medan no longer positions North Sumatra local wisdom as a static object of the past but as a high-impact research currency, enabled by artificial intelligence and gamification tools, then disseminated on the world stage through international forums. Furthermore, this strategic novelty is also manifested in a shift in the BLU income-generating model. Universitas Negeri Medan progressively shifted from conventional reliance on leasing physical assets to a financial circularity based on intellectual property, which has empirically been shown to increase the flow of international research grants.

Theoretically, the results contribute to the application of RBV theory in the public sector. Universitas Negeri Medan demonstrates that in the digital era, intangible assets such as the global mindset of the academic community, the expertise of Fulbright Scholar lecturers, and institutional reputation have a greater influence on building long-term competitive advantage than the ownership of physical assets. Furthermore, steps to redefine the Quadruple Helix model suggest post-pandemic higher education institutions are capable of playing the role of central aggregators that simultaneously align the interests of government regulations (IKU achievement), industry profitability (commercial contract research projects), and the real needs of society (preservation of tradition). Practically, the successful transition of the OBE curriculum and the management of non-UKT PNPB funds can serve as a practical blueprint for other LPTK in Indonesia to produce global graduates without losing their reputation as teacher producers. To eliminate the phenomenon of paper partnerships, Universitas Negeri Medan needs to implement a tactical blueprint embedded in a formal, quarterly action plan. This step is designed to break with the tradition of signing ceremonial MoUs and to convert into implementable, measurable MoAs that directly impact the university's IKU achievement. In the first quarter, partnerships identified as passive or not generating tangible activity within 12 months are immediately moved to dormant status. To ensure accountability from the start, each faculty is required to complete a Commitment Worksheet detailing specific IKU achievement targets before the partnership document is processed by the rectorate. In the second quarter, the action plan shifts to the driving phase, which relies on financial incentives and bureaucratic facilitation at the faculty level. Universitas Negeri Medan allocates special stimulus funds from PNPB to support faculty programs that successfully reactivate passive MoUs into operational MoAs. This step is reinforced by establishing the Partnership Clinic (*Kemitraan Klinik*) in each deanery, a regular mentoring forum that trains Heads of Study Programs to compile activity proposals with high bargaining value for external partners.

Systematic acceleration was implemented in the third quarter through the integration of digital information systems and strict field monitoring. Universitas Negeri Medan launched the SIM-KRS (Cooperation Management Information System) Dashboard, a digital platform that tracks the real-time status of document activity and automatically alerts the dean's office when any partnerships are approaching expiration without a signed MoA. The lower-level organizational structure was also strengthened by appointing Partnership Liaison Officers (PLOs) in each faculty. These liaison officers monitor monthly developments in the field and report results directly to the Vice Rector for Cooperation. In this phase, every scientific output from international MoAs is automatically synchronized with the quality assurance system to validate the institution's research performance. The action plan concluded in the fourth quarter with a sustainability phase that prioritizes performance evaluation and full reconciliation. The rectorate implemented a fair Reward and Punishment system, in which the MoU-MoAs conversion ratio is a key component of the Dean's annual performance report. The faculty that records the highest conversion ratio will be awarded an additional budget ceiling for internal research grants in the following fiscal year. This annual cycle concludes with the Universitas Negeri Medan Partners Evaluation Night forum, a space to appreciate Quadruple Helix elements, renew productive cooperation contracts, and firmly sever ties with uncooperative partners. Clean MoAs data and the high economic value collected from this action plan will then serve as fundamental legal documents to accelerate institutional transition into the status of a Legal Entity State University (*Perguruan Tinggi Negeri Berbadan Hukum* [PTN-BH]).

To secure the sustainability of academic and financial performance in the future, this research recommends three strategic policies. First, the university should institutionalize inbound and outbound mentorship schemes, namely securing the stability of the unique intellectual assets by requiring senior academics after overseas assignments to foster a group of young researchers across faculties in a co-authorship cluster to increase the volume of publications in the Upper Quartile Scopus journals (Q1 and Q2). Second, the university should promote collective digitization of cultural assets through integrated clusters, namely, encouraging cross-disciplinary collaboration between faculties to establish a Digital Humanities Innovation Center. Third, the establishment of the Universitas Negeri Medan Industrial Advisory Board through the preparation of regulations that directly involve national and regional-scale industry representatives in the OBE curriculum reconstruction process in each program to ensure a high level of graduate absorption in the workforce. All three provide absolute flexibility to establish a distinct venture capital company, expand global partnerships, and independently recruit foreign talent to accelerate progress toward becoming a WCU.

6. Conclusion

In conclusion, the transformation of Universitas Negeri Medan in the 21st century demonstrates that collaboration and internationalization are not only quantitative measures on paper but depend on the depth of implementation and real impact. By integrating the triple-lens framework, comprising comprehensive internationalization, institutionalism, and RBV, with the Quadruple Helix model, the university has successfully converted its unique internal assets into global competitiveness. The increase from 12 to 65 international partnerships, accompanied by the publication of 75 Scopus Q1 and Q2 articles, indicates the success of the institutional governance. This acceleration is structurally reinforced by regional digital cultural diplomacy and research commercialization, which enhance revenue. To secure the sustainability of this achievement, implementing a formal action plan, enforcing a strict "No MoAs, No MoUs" policy, and institutionalizing the SIM-KRS digital system are decisive steps that must be taken. This orchestration not only enhances the university's achievements but also emphasizes its identity as a resilient institution.

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