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Mapping key performance indicators for evaluation and monitoring the internationalization of higher education institutions

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Abstract

Purpose of this paper is to identify and map key performance indicators (KPIs) for evaluating and monitoring the internationalization of higher education institutions (HEIs).

A systematic review methodology of Google Scholar and Scopus guided by the preferred reporting items for systematic reviews and meta-analyses (PRISMA) approaches in order to offer a comprehensive set of metrics for institutions to monitor their internationalization strategies.

Findings reveal a list of ninety-six (96) KPIs with their evaluation equations which categorized into nine (9) criteria, of international student, student mobility, faculty mobility, faculty international profile and experience, study programs with international elements, double/joint degree programs, international partnerships and networks, international research and international oriented management and governance.

Practical implications include providing HEIs with a structured framework for monitor internationalization and informing strategic decision-making and also contributes to the growing section of knowledge on internationalization.

Keywords: Key performance indicators, higher education internationalization, monitor university performance, HEI promotion

Introduction

Key performance indicators (KPIs) are essential tools for monitoring the internationalization of higher education institutions (HEIs). Internationalization of higher education has become a critical strategy for universities worldwide, aimed at enhancing global engagement, fostering cross-cultural understanding and improving the quality and competitiveness of education institutions (Rayner, *et al.* 2023) [23].

Indicators standardized the approach to evaluating progress, enabling institutions to track their performance over time and make data-driven decisions (Al Khafaji, 2018) [2]. This research provides a practical tool for policymakers and institutional leaders to evaluate and enhance the internationalization processes within their institutions (Hermann, 2024) [9]. Recent research argue that existing KPIs focus too narrowly on aspects such as student mobility, overlooking critical dimensions like the internationalization of the curriculum, partnerships and governance structures. They highlight the need for more inclusive indicators that focus on these additional components to provide a complete frame of internationalization efforts (Barber, 2018) [3]. Some articles introduced the concept of "comprehensive internationalization," emphasizing the need for HEIs to embed global engagement across all academic, operational, and administrative functions (Watabe, 2021) [26]. Similarly, researchers argue that the existing indicators are insufficient to capture these emerging trends and stress the need for a dynamic, comprehensive framework that adapts to evolving global educational landscapes (Kayyali, 2023) [11].

The study aims to compile existing indicators in a map of list and is guided by the following questions:

RQ1. Which are the most common KPIs to monitor the internationalization of HEIs?

RQ2. Can these KPIs categorized and applied across different criteria?

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Review

As universities strive to integrate international criteria into their core activities such as study programs, research, student mobility, faculty experience, faculty mobility, partnerships and management there is a growing need for mechanisms to evaluate and monitor these efforts (Ota, 2018)^[18]. International students is one of the most important criteria of internationalization. Their presence enriches the academic environment, providing a variety of perspectives that contribute to a more vibrant and inclusive educational experience (Opmane, *et al.* 2024)^[17]. To measure the impact of international student, several KPIs have been used such as percentage of international postgraduate students on institute and percentage of international higher research students on institute (Knight, 2015)^[12].

Proportion of international students and number of students participating in exchange programs presents students' mobility as indicators of internationalization. Internationalization of HEIs involves integrating global dimensions into teaching, research and service functions. Student mobility is a central aspect of this, promoting intercultural understanding (Chang, 2018)^[6]. Literature highlights two primary forms of mobility, international students coming to the institution and domestic students studying abroad. Increased student mobility can improve institutional reputation, attract international partnerships and diversify the student body, contributing to a richer learning environment (Soysal, *et al.* 2020)^[24].

Faculty mobility is a major dimension of HEI internationalization. Monitoring faculty mobility is essential for understanding how well an institution is engaging with the global academic community and fostering intellectual exchange (Pliner, 2022)^[19]. A common KPI that monitors faculty mobility is number of faculty members participating in international exchanges or research collaborations that reflects an institution's ability to integrate its academic staff into global networks. Another significant indicator is the rate of international faculty hires, which measures the extent to which institutions attract scholars with diverse backgrounds (Poole, 2020)^[20].

The international profile and experience of faculty is an important criterion in evaluating the internationalization of HEIs (Li, *et al.* 2021)^[14]. Academics with global expertise elevate an institution's reputation, support international partnerships, and introduce diverse viewpoints into their teaching and research activities. Faculty participation in global initiatives is a major factor in creating international learning environments (Buttitta, 2023)^[5]. To measure this criterion an indicator is the proportion of faculty involved in international teaching or research, which demonstrates the institution's ability to attract or cultivate faculty with global engagement (Teichler, 2017)^[25]. Another important KPI is the number of international academic roles held, such as visiting professorships or guest lectureships abroad, which boosts the institution's recognition and standing in global academic circles. Additionally, the extent of international research collaborations and publications serves as a crucial metric for evaluating a faculty's involvement in global academic networks (Gao, 2015)^[17].

Study programs is a key criterion for assessing the internationalization of HEIs. Integrating global perspectives into curricula not only broadens students' intercultural

competence but also ensures alignment with global academic and professional trends (OECD, 2016)^[16]. Emphasizes that the incorporation of international elements within academic programs plays a pivotal role in preparing graduates for participation in an increasingly globalized workforce. To evaluate the internationalization of study programs, a crucial KPI is the proportion of programs offering international or intercultural components, such as courses addressing global issues or those delivered by faculty with international experience. Furthermore, international student participation in these programs whether through exchange, collaborative online courses, or full enrollment serves as an indicator of the institution's ability to attract and integrate diverse student populations (Qu, 2024)^[21].

Joint study programs are widely regarded as an essential criterion for assessing the internationalization. As (Adhikariparajuli, 2021)^[1] suggests, joint and double degrees are not only a tool for academic partnership but also an indicator of an institution's global engagement and competitiveness in the international higher education landscape. Several KPIs are commonly used to monitor the impact of double study programs such as the number of active double or joint degree programs, student enrollment in these programs and the rate of program completion (Yang, 2014)^[27]. Number of formal agreements and partnerships established with foreign institutions, are KPIs of dimension of partnerships which are fundamental to the internationalization (Kondo, *et al* 2024)^[13]. As Bell (2024)^[4] argues, effective international partnerships not only enhance the institution's visibility but also contribute significantly to its academic and cultural richness.

Engaging in collaborative research across borders not only enhances the global visibility of an institution but also contributes to the advancement of knowledge. According to Kamyab (2023)^[10], international research collaboration serves as a benchmark for measuring an institution's commitment to addressing global challenges through collective expertise and diverse perspectives and significant KPIs are the number of international research publications and the amount of funding secured for international research projects (Ramos-Eclevia, 2023)^[22]. Internationally oriented management is vital criterion of the internationalization and according to Hassim, (2024)^[8] effective governance structures that prioritize internationalization can enhance the institution's ability to attract diverse talent and global partnerships (Nguyen, *et al.* 2024)^[15].

Methodology

This study uses a systematic review to identify KPIs for evaluating and monitoring the internationalization of HEIs. Follows a systematic review methodology guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach. This approach is chosen because it provides a structured and transparent method for synthesizing research evidence, which is essential for achieving the study's aim of developing a comprehensive framework based on existing literature. Figure 1 presents the PRISMA flowchart that illustrates the flow of studies through the different phases of the review identification, screening, eligibility and inclusion.

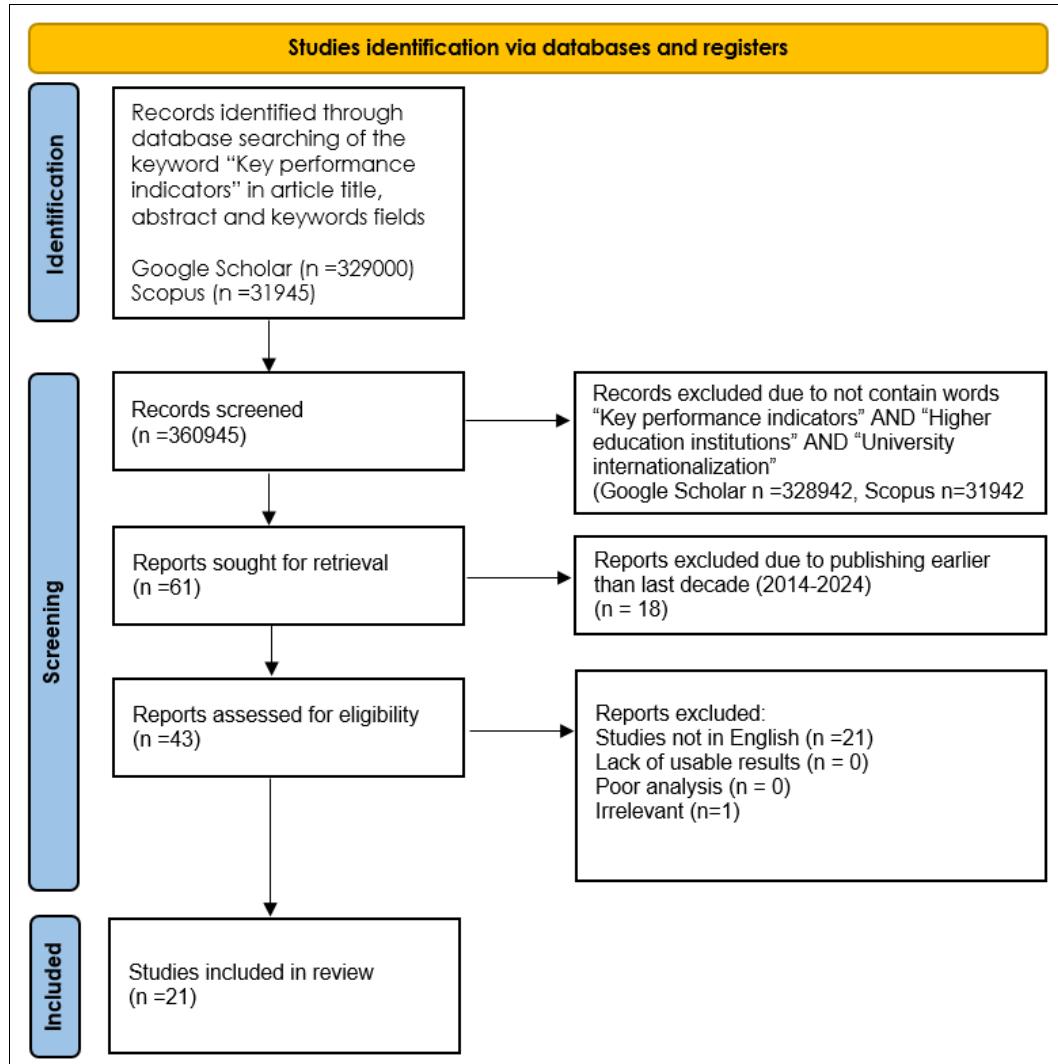


Fig 1: PRISMA flowchart for selected keywords.

Research conducted across academic databases of Scopus and Google Scholar. Google Scholar provided a wide array of academic content, including articles, theses, conference papers and books. This extensive coverage gathering a diverse range of studies. However, Google Scholar may yield results that vary in quality, and also we used Scopus for more curated selection of peer-reviewed journals, conference proceedings and scholarly materials.

To get relevant results on Google Scholar we use quotes (" ") to ensure that terms "Key Performance Indicators", "Higher Education Institutions", "University Internationalization" are treated as a single term, avoiding results where the words are scattered. Then we combined the three main terms using the AND operator to ensure you get results that cover all aspects of KPI, HEI and

internationalization, "Key Performance Indicators" AND "Higher Education Institutions" AND "University Internationalization" (Table 1). On Scopus, the search strategy included refining search to specific fields of article title, abstract and keywords for more precise results. We search for terms within TITLE-ABS-KEY, which focuses on the most relevant sections of articles. Search query that used is "Key Performance Indicators" AND "Higher Education Institutions" AND "University Internationalization".

Additionally, we applied filters such as date range and we set to publications from last decade 2014-2024 to get more recent studies and to reflect contemporary practices and trends. For eligibility used criteria like study design, study language, outcomes and analysis.

Table 1: Records identified on databases for search terms

Databases	Search terms (In Article title, Abstract and Keywords)		
	Key performance indicators	Key performance indicators AND Higher education institutions	Key performance indicators AND Higher education institutions AND University internationalization
Google Scholar	329.000	12.100	58
Scopus	31.945	250	3
Total	360.945	12.350	61

4. Results

Research found ninety-six (96) KPIs which categorized within the following nine (9) criteria.

4.1 KPIs for international student criterion

Percentage of international students on institute provides an overarching view of how many international students are pursuing degree programs at a university. It reflects the institution's global reach and attractiveness to students from different countries. A higher percentage indicates a more internationally diverse student body, which can enhance the institution's global reputation and educational quality. Percentage of international undergraduate students on institute targets the internationalization efforts at the undergraduate level and percentage of international postgraduate students on institute evaluates the institution's success in attracting and retaining students in advanced taught programs. International student graduation rate evaluates the percentage of international students who complete their programs within the expected timeframe. Percentage of international students receiving financial aid or scholarships is the proportion of international students who benefit from institutional financial support and shows how accessible the institution's programs are to students from diverse financial backgrounds and the institution's commitment to supporting international talent. International student satisfaction and experience scores monitors overall experience including academic support, campus life and cultural integration. Percentage of international higher research students on institute assesses the involvement of

international students such as doctoral studies and indicates a strong research orientation and an institution's ability to attract top research talent from around the world. Percentage of international students by region tracks the geographic distribution of international students providing insights into the diversity of the student population and highlights trends in recruitment from different regions and percentage of international students in exchange programs measures the proportion of international students participating in exchange programs, such as student exchange or study abroad initiatives. International student retention rate (ISRR) monitors the percentage of international students who continue their studies at the same institution from one year to the next. High retention rates indicate successful integration and satisfaction among international students, while lower rates may signal issues with support services or academic challenges.

$$ISRR = \left(\frac{\text{Number of returning international students in the current year}}{\text{Number of international students enrolled in the previous year}} \right) \times 100$$

International student participation in campus activities measures the level of involvement of international students in various campus activities, including academic, cultural, and extracurricular events and percentage of international students completing full degree programs (PISFDP), evaluates international students that enrolled in full-degree programs (as opposed to short-term or exchange programs).

$$PISFDP = \left(\frac{\text{Number of international students in full-degree programs}}{\text{Total number of international students}} \right) \times 100$$

Table 2: KPIs to monitor international student criterion

Criterion	KPIs
International student	<ol style="list-style-type: none"> 1. Percentage of all international students on institute 2. Percentage of international undergraduate students on institute 3. Percentage of international postgraduate students on institute 4. International student graduation rate 5. Percentage of international students receiving financial aid or scholarships 6. International student satisfaction and experience scores 7. Percentage of international higher research students on institute 8. Percentage of international students by region 9. Percentage of international students in exchange programs 10. International student retention rate 11. International student participation in campus activities 12. Percentage of international students completing full degree programs

4.2 KPIs for student mobility criterion

Percentage of domestic students with international study experiences measures domestic students who have participated in international study programs exchange, internships, and research collaborations and ratio of outgoing domestic students to incoming international students (RODSIIS) compares the number of domestic students participating in international experiences to the number of international students coming in. A balanced ratio suggests an institution is facilitating both outbound and inbound mobility effectively.

$$RODSIIS = \frac{\text{Number of outgoing domestic students}}{\text{Number of incoming international students}}$$

Percentage of international students to total enrollment (PISTE), is the proportion of international students relative to the institution's total student population.

$$PISTE = \left(\frac{\text{Number of international students}}{\text{Total number of students enrolled}} \right) \times 100$$

Growth rate of outgoing domestic students, reflects the growth trend in the number of domestic students engaging in international experiences, helping assess the institution's progress in promoting outbound mobility and percentage of graduates with international experience (PGIE), monitors the proportion of graduates who participated in international study or work experiences during their degree.

$$PGIE = \left(\frac{\text{Number of graduates with international experience}}{\text{Total number of graduates}} \right) \times 100$$

Average duration of outbound student mobility programs (ADOSMP), measures the average length of time that domestic students spend on international mobility programs.

$$ADOSMP = \frac{\sum \text{Duration of each student's program}}{\text{Number of students who participated}}$$

Table 3: KPIs to monitor student mobility criterion

Criterion	KPIs
Student mobility	<ol style="list-style-type: none"> 1. Percentage of domestic students with international study experiences 2. Ratio of outgoing domestic students to incoming international students 3. Percentage of international students to total enrollment 4. Growth rate of outgoing domestic students 5. Percentage of graduates with international experience 6. Average duration of outbound student mobility programs

4.3 KPIs for faculty mobility criterion

Percentage of faculty engaged in international mobility (PFEIM) assesses how many faculty members have

participated in mobility activities, such as exchanges, visiting professorships, or international research projects, relative to the total faculty size.

$$PFEIM = \left(\frac{\text{Number of faculty involved in international mobility}}{\text{Total number of faculty}} \right) \times 100$$

Percentage of inbound faculty monitors the proportion of faculty members from other institutions or countries who visit the HEI for teaching, research, or collaboration over a

defined period and assesses how successful the HEI is in attracting international faculty for visiting professorships, research collaborations, and exchange programs.

$$\text{Percentage of inbound faculty} = \left(\frac{\text{Number of inbound international faculty}}{\text{Total number of faculty}} \right) \times 100$$

Percentage of outbound faculty tracks the number of faculty members who go abroad for teaching, research, or conferences as part of international mobility programs. This KPI evaluates how many faculty members are engaged in

international activities outside their home institution, such as international teaching exchanges, research collaborations, or conference participation.

$$\text{Percentage of outbound faculty} = \left(\frac{\text{Number of outbound international faculty}}{\text{Total number of faculty}} \right) \times 100$$

Faculty mobility ratio (inbound to outbound) compares the number of international faculty visiting the HEI to the number of its faculty members participating in outbound mobility. A balanced ratio of inbound and outbound faculty indicates effective reciprocal exchanges.

$$\text{Faculty mobility ratio} = \frac{\text{Number of inbound international faculty}}{\text{Number of outbound faculty members}}$$

Percentage of faculty receiving international mobility funding (PFRIMF) measures the percentage of faculty members who receive institutional or external financial support for international mobility activities and reveals how well the institution supports faculty in engaging with international mobility programs by providing financial assistance, which can be a key enabler for international participation.

$$PFRIMF = \left(\frac{\text{Number of faculty receiving mobility funding}}{\text{Total number of faculty}} \right) \times 100$$

Percentage of faculty presenting at international conferences monitors the proportion of faculty members who have presented research at international conferences in a given time frame and evaluates the visibility and academic involvement of faculty in international forums, a key indicator of global academic standing. Faculty exchange program participation rate (FEPPR) tracks the percentage of faculty who have participated in formal international faculty exchange programs.

$$FEPPR = \left(\frac{\text{Number of faculty participating in exchange programs}}{\text{Total number of faculty}} \right) \times 100$$

Faculty satisfaction with international mobility programs evaluates the overall satisfaction of faculty members who have participated in international mobility programs, typically via survey results.

$$\text{Faculty Satisfaction with Mobility Programs} = \left(\frac{\text{Number of satisfied participants}}{\text{Total number of participants}} \right) \times 100$$

Average duration of faculty mobility (ADFM) measures the average length of time that outbound faculty members spend abroad for international mobility programs and provides

insight into the depth and significance of international experiences by measuring the duration of faculty stays abroad.

$$ADFM = \frac{\text{Total number of days faculty spent abroad on mobility programs}}{\text{Total number of outbound faculty members}}$$

Table 4: KPIs to monitor faculty mobility criterion

Criterion	KPIs
Faculty mobility	<ol style="list-style-type: none"> 1. Percentage of faculty engaged in international mobility 2. Percentage of inbound faculty 3. Percentage of outbound faculty 4. Faculty mobility ratio (inbound to outbound) 5. Proportion of faculty receiving international mobility funding 6. Percentage of faculty presenting at international conferences 7. Faculty exchange program participation rate 8. Faculty satisfaction with international mobility programs 9. Average duration of faculty mobility (Outbound)

KPIs for faculty international profile and experience criterion

Number of international research collaborations per faculty

(NIRCPF) tracks the average number of international research collaborations that faculty members are engaged in within a specified time period.

$$NIRCPF = \frac{\text{Total number of international research collaborations}}{\text{Total number of faculty members}}$$

Percentage of faculty who received the highest academic degree abroad (PFRHADA) calculates the percentage of full-time equivalent faculty members who received their

highest academic degree such as Ph.D. or post-Doctorate from a foreign institution.

$$PFRHADA = \left(\frac{\text{Number of faculty with degrees from foreign institutions}}{\text{Total number of faculty members}} \right) \times 100$$

Percentage of faculty who have at least two years abroad (PFLTYA) monitors the percentage of faculty members who have spent at least two years working, researching or lecturing abroad, not including time spent studying for a degree.

$$PFLTYA = \left(\frac{\text{Number of faculty with 2 + years abroad}}{\text{Total number of faculty members}} \right) \times 100$$

Percentage of faculty who teach international students (PFTIS), tracks the percentage of faculty members who are actively teaching courses to international students enrolled at the institution.

$$PFTIS = \left(\frac{\text{Number of faculty teaching international students}}{\text{Total number of faculty members}} \right) \times 100$$

Percentage of faculty who hold a visiting lectureship abroad (PFVLA), calculates the percentage of faculty who have held a position as a visiting lecturer at a foreign institution.

$$PFVLA = \left(\frac{\text{Number of faculty with visiting lectureships abroad}}{\text{Total number of faculty members}} \right) \times 100$$

Percentage of faculty involved in international academic conferences, monitors the percentage of faculty members who have presented papers, chaired sessions, or otherwise participated in international academic conferences during a specific period, number of faculty serving on international academic boards/committees, measures the number of faculty members who hold positions on international academic boards, committees, or advisory groups,

percentage of faculty with international fellowships or awards (PFIFA) calculates the percentage of faculty members who have been awarded prestigious international fellowships, scholarships, or academic awards.

$$PFIFA = \left(\frac{\text{Number of faculty with international fellowships or awards}}{\text{Total number of faculty members}} \right) \times 100$$

Percentage of faculty involved in international curriculum development, measures the percentage of faculty members who have contributed to the development or revision of academic curricula in collaboration with international institutions or for global programs, percentage of faculty serving as advisors or supervisors for international students' research (PFSAISR) tracks the percentage of faculty members who serve as academic advisors or research supervisors for international students pursuing research degrees as Ph.D. and master's.

$$PFSAISR = \left(\frac{\text{Number of faculty advising international students}}{\text{Total number of faculty members}} \right) \times 100$$

Percentage of faculty engaged in international joint degree programs, calculates the percentage of faculty members involved in teaching, research, or administration of international joint degree programs between the institution and foreign universities, percentage of faculty who collaborate with international industry partners (PPFCIIP), evaluates the percentage of faculty members who collaborate on research, projects, or other initiatives with international industry partners.

$$PPFCIIP = \left(\frac{\text{Number of faculty collaborating with international industry}}{\text{Total number of faculty members}} \right) \times 100$$

Table 5: KPIs to monitor faculty international profile and experience criterion

Criterion	KPIs
Faculty international profile and experience	<ol style="list-style-type: none"> 1. Number of international research collaborations per faculty 2. Percentage of faculty who received the highest academic degree abroad 3. Percentage of faculty who have at least two years abroad 4. Percentage of faculty who teach international students 5. Percentage of faculty who hold a visiting lectureship abroad 6. Percentage of faculty involved in international academic conferences 7. Number of faculty serving on international academic boards/committees 8. Percentage of faculty with international fellowships or awards 9. Percentage of faculty involved in international curriculum development 10. Percentage of faculty serving as advisors or supervisors for international students' research 11. Percentage of faculty engaged in international joint degree programs 12. Percentage of faculty who collaborate with international industry partners

KPIs for Study programs with international elements criterion

Number of subjects involving international partner institutions, tracks the number of subjects that involve collaboration with partner institutions from other countries such as joint courses, co-teaching, international guest lectures, percentage of undergraduate programs offered in a foreign language (PUPFL), helps to measure the extent to which international accessibility is provided at the undergraduate level.

$$PUPFL = \left(\frac{\text{Percentage of undergraduate programmes in foreign language}}{\text{Total number of undergraduate programmes}} \right) \times 100$$

$$\text{Online programmes available} = \sum_{i=1}^n (\text{Programmes available online to international students})$$

Number of subjects offered in a foreign language, monitors the number of subjects offered in languages other than the

$$\text{Number of Subjects in a Foreign Language} = \sum_{i=1}^n (\text{Subjects delivered in foreign languages})$$

Number of programs with a mandatory study abroad component measures the number of study programs that require students to study abroad for a portion of their

$$\text{Programmes mandatory study abroad} = \sum_{i=1}^n (\text{Programmes with mandatory international experience})$$

Percentage of programs with international accreditation, evaluates the proportion of study programs that have been accredited by international bodies or organizations, percentage of students enrolled in internationally themed

Percentage of postgraduate programs offered in a foreign language (PPPFL), measures the proportion of postgraduate programs delivered in a foreign language.

$$PPPFL = \left(\frac{\text{Percentage of post graduate programmes in foreign language}}{\text{Total number of post graduate programmes}} \right) \times 100$$

Number of programs available via online learning platforms to international students, counts the programs available online either fully or partially and open to students globally, giving a measure of the institution's digital international reach.

institution's primary language of instruction.

$$\text{Number of Subjects in a Foreign Language} = \sum_{i=1}^n (\text{Subjects delivered in foreign languages})$$

degree. This shows the degree of commitment to international mobility.

programs monitors the number of students enrolled in internationally oriented programs as a percentage of the total student body, reflecting the institution's global appeal.

Table 6: KPIs to monitor study programs with international elements criterion

Criterion	KPIs
Study programs with international elements	<ol style="list-style-type: none"> 1. Number of subjects involving international partner institutions 2. Percentage of undergraduate programs offered in a foreign language 3. Percentage of postgraduate programs offered in a foreign language 4. Number of programs available via online learning platforms to international students 5. Number of subjects offered in a foreign language 6. Number of programs with a mandatory study abroad component 7. Percentage of programs with international accreditation 8. Percentage of students enrolled in internationally themed programs

KPIs for double/joint degree programs criterion

Number of double/joint degree programs with foreign universities tracks the

$$\text{Number of Double/Joint Degree Programs} = \sum_{i=1}^n (\text{Joint degree programmes with foreign universities})$$

Percentage growth in joint degree programs (PGJDP) measures the year-on-year growth rate of double or joint

$$PGJDP = \left(\frac{\text{No of joint degree programs (Current Year)} - \text{No of Programs (Previous Year)}}{\text{Number of Programs (Previous Year)}} \right) \times 100$$

Student enrollment in double/joint degree programs tracks the proportion of students enrolled in double or joint degree programs relative to the total student population, graduation

$$GRDDP = \left(\frac{\text{Number of Graduates from Double/Joint Degree Programs}}{\text{Total Enrolled in Double/Joint Degree Programs}} \right) \times 100$$

Student satisfaction with double/joint degree programs measures the percentage of students who report being satisfied with their experience in double or joint degree programs, alumni employment rate from double/joint degree programs measures the employability of graduates from double or joint degree programs, diversity of countries in double/joint degree programs tracks the geographical

number of degree programs co-offered with foreign institutions, resulting in a double or joint degree and measures the extent of formal international collaboration.

degree programs.

rate from double/joint degree programs (GRDDP) measures the percentage of students enrolled in double/joint degree programs who successfully complete and graduate.

diversity of the international partners involved in double or joint degree programs, financial investment in double/joint degree programs evaluates the financial resources allocated to the development, maintenance, and growth of double or joint degree programs. Higher investment indicates institutional commitment to these internationalization efforts and the desire to enhance or expand these offerings.

Table 7: KPIs to monitor double/joint degree programs criterion

Criterion	KPIs
Double/joint degree programs	<ol style="list-style-type: none"> 1. Number of double/joint degree programs with foreign universities 2. Percentage growth in joint degree programs 3. Student enrollment in double/joint degree programs 4. Graduation rate from double/joint degree programs 5. Student satisfaction with double/joint degree programs 6. Alumni employment rate from double/joint degree programs 7. Diversity of countries in double/joint degree programs 8. Financial investment in double/joint degree programs

KPIs for international partnerships and networks criterion

Number of memberships in international organizations tracks the university's involvement in international academic and research organizations, associations and networks. Number of international partners with active academic collaborations measures the number of international partners with whom the institution has had meaningful academic collaborations, such as student/staff exchanges, joint research projects, or joint academic programs. It reflects the depth and scope of the university's international partnerships and helps assess the success of internationalization initiatives. Percentage of active international partnerships relative to total partnerships (PAIP) provides a measure of the effectiveness of the university's international partnerships. It reflects how many partnerships result in tangible academic outcomes, as opposed to being inactive or superficial.

$$PAIP = \left(\frac{\text{Number of active international partnerships}}{\text{Total number of international partnerships}} \right) \times 100$$

Percentage of international alumni relative to total alumni (PIA) calculates the proportion of the university's alumni

who are international students and reflects the global reach of the institution's programs and its ability to attract students from abroad.

$$PIA = \left(\frac{\text{Number of international alumni}}{\text{Total number of alumni}} \right) \times 100$$

Percentage of alumni working abroad (PAWA) tracks the percentage of the university's alumni who are working and networking in foreign countries.

$$PAWA = \left(\frac{\text{Number of alumni working abroad}}{\text{Total number of alumni}} \right) \times 100$$

Number of international academic and research collaborations measures the total number of international research projects, joint publications and academic collaborations with global institutions. Percentage of Alumni participation in international alumni networks (PAPIN) monitors the percentage of alumni actively participating in international alumni networks or chapters and as a result university maintains strong global connections with its alumni and foster a sense of belonging and engagement within its international graduate

community.

$$PAPIN = \left(\frac{\text{Number of alumni participating in international alumni networks}}{\text{Total number of alumni}} \right) \times 100$$

Number of international joint conferences and workshops, tracks the number of international conferences, seminars, and workshops that the university either hosts or co-hosts with international partners. Number of international alumni engaged in leadership positions globally tracks the number

of the university's international alumni who are in leadership or senior roles abroad. Percentage of international research publications co-authored with international partners (PIRPCO) measures the proportion of the university's research output that involves international collaboration.

$$PPIRPCO = \left(\frac{\text{Number of research publications co-authored with international partners}}{\text{Total number of research publications}} \right) \times 100$$

Table 8: KPIs to monitor international partnerships and networks criterion

Criterion	KPIs
University international partnerships and networks	<ol style="list-style-type: none"> 1. Number of memberships in international organizations 2. Number of international partners with active academic collaborations 3. Percentage of active international partnerships relative to total partnerships 4. Proportion of international alumni relative to total alumni 5. Percentage of alumni working abroad 6. Number of international academic and research collaborations 7. Alumni participation in international alumni networks 8. Number of international joint conferences and workshops 9. Number of international alumni engaged in leadership positions globally 10. Percentage of international research publications co-authored with international partners

KPIs for international research criterion

Percentage of internationally cooperative research programs (PICRP), tracks the number of research programs the institution participates in that involve collaboration with international institutions, organizations or networks.

$$PICRP = \left(\frac{\text{Number of internationally cooperative research programs}}{\text{Total number of research programmes}} \right) \times 100$$

Percentage of Internationally focused research centers, counts the number of research centers within the institution that have a specific focus on international issues, operate globally or collaborate with international researchers and institutions.

$$\text{Percentage} = \left(\frac{\text{Number of internationally focused research centers}}{\text{Total number of research centers}} \right) \times 100$$

Number of joint international research proposals submitted, reflects the institution's proactive engagement in seeking collaborative research opportunities with international institutions. Percentage of research funding from international sources (PRFIS), measures the proportion of research funding coming from international grants or collaborations and indicates the university's ability to attract international financial support for its research programs, highlighting international relevance and funding competitiveness.

$$PRFIS = \left(\frac{\text{Funding from international sources}}{\text{Total research funding}} \right) \times 100$$

Number of countries involved in cooperative research, measures the number of different countries involved in the institution's cooperative research programs and helps assess the geographic diversity of the institution's international research partnerships. Percentage of research output from international collaborations (PROIC) measures the

proportion of research publications that result from international cooperative research programs.

$$PROIC = \left(\frac{\text{Number of publications from international collaborations}}{\text{Total research publications}} \right) \times 100$$

Percentage of research centers with international collaborations (PRCIC), measures the proportion of research centers that actively collaborate with international institutions.

$$PRCIC = \left(\frac{\text{Number of centres with international collaborations}}{\text{Total number of research centers}} \right) \times 100$$

Number of international research projects led by research centers tracks the number of international research projects that are led by the institution's research centers. Number of international visitors to research centers, tracks the attraction of international expertise to the institution, showcasing its global reputation and international engagement. Percentage of research centers participating in international networks (PRCIN) reflects the integration of research centers into international academic and research networks, facilitating cross-border collaboration and knowledge exchange.

$$PRCIN = \left(\frac{\text{Number of centres in international networks}}{\text{Total number of research centres}} \right) \times 100$$

Number of international researcher exchanges, tracks the number of exchange programs for international researchers. Percentage of international researchers (PIR), measures the proportion of researchers at the institution who come from outside the country and reflects the diversity of the research workforce.

$$PIR = \left(\frac{\text{Number of international researchers}}{\text{Total number of researchers}} \right) \times 100$$

Percentage of international postdoctoral researchers (PIPR), indicates the institution's attractiveness to early-career international researchers, helping to assess global talent acquisition at the postdoctoral level.

$$PIPR = \left(\frac{\text{Number of international postdoctoral researchers}}{\text{Total number of postdoctoral researchers}} \right) \times 100$$

Number of international research fellowships awarded, counts the number of international research fellowships awarded to researchers at the institution. Percentage of research positions open to international candidates (PROPIC), measures the proportion of research positions at the institution that are advertised and open to international candidates.

$$PROPIC = \left(\frac{\text{Number of research positions open to international candidates}}{\text{Total number of research positions}} \right) \times 100$$

Number of international research awards, counts the number of prestigious international research awards or recognitions received by the institution or its researchers. Percentage of

publications in internationally ranked journals (PPIRJ) measures the proportion of research publications in internationally recognized and high-ranking journals.

$$PPIRJ = \left(\frac{\text{Number of publications in ranked journals}}{\text{Total number of publications}} \right) \times 100$$

Number of international patents filed, tracks the number of patents filed or granted in foreign countries as a result of the institution's research. Number of international collaborative research grants won, counts the number of collaborative research grants won through international partnerships. This KPI tracks the success of the institution in securing international funding for collaborative research, highlighting its competitive position globally. Percentage of research citations from international sources (PRCIS)assesses the international recognition and relevance of the institution's research in the global academic community.

$$PRCIS = \left(\frac{\text{Number of international citations}}{\text{Total number of citations}} \right) \times 100$$

Table 9: KPIs to monitor international research criterion

Criterion	KPIs
International research	<ol style="list-style-type: none"> 1. Percentage of internationally cooperative research programs 2. Percentage of internationally focused research centers 3. Number of joint international research proposals submitted 4. Percentage of research funding from international sources 5. Number of countries involved in cooperative research 6. Percentage of research output from international collaborations 7. Percentage of research centers with international collaborations 8. Number of international research projects led by research centers 9. Number of international visitors to research centers 10. Percentage of research centers participating in international networks 11. Number of international researcher exchanges 12. Percentage of international researchers 13. Percentage of international postdoctoral researchers 14. Number of international research fellowships awarded 15. Percentage of research positions open to international candidates 16. Number of international research awards 17. Percentage of publications in internationally ranked journals 18. Number of international patents filed 19. Number of international collaborative research grants won 20. Percentage of research citations from international sources

KPIs for international oriented management/governance criterion: Staff-to-International-Student Ratio tracks the

adequacy of human resources dedicated to supporting international students and activities.

$$\text{Staff to international student ratio} = \frac{\text{Number of staff dedicated to international activities}}{\text{Total international students}}$$

Training hours per staff member for internationalization (THSMI) is the average number of training hours related to international activities per staff member involved in internationalization and measures institutional investment in enhancing staff skills for managing internationalization.

$$THSMI = \frac{\text{Total training hours for internationalization}}{\text{Number of staff involved in internationalization}}$$

Percentage of budget dedicated to internationalization (PBDI) is the proportion of the institution's overall budget allocated to internationalization activities.

$$PBDI = \left(\frac{\text{Funding for international activities}}{\text{Total institutional budget}} \right) \times 100$$

Cost per international student, tracks the average financial expenditure per international student enrolled and measures the financial efficiency of supporting international students.

$$\text{Cost per international student} = \frac{\text{Total internationalization expenses}}{\text{Total number of international students}}$$

Funding for international research projects, measures the total financial resources allocated to support research initiatives that involve international collaboration or partnerships.

Funding for International Research Projects= Total funds allocated to international research (currency units)
 Number of scholarships for international students (all degree levels) measures the total number of scholarships awarded to international students across all degree levels, including undergraduate, master's, and doctoral programs. The KPI indicates the institution's efforts to attract and support a diverse international student population by providing financial assistance.

Number of Scholarships for International Students=Total scholarships awarded to international students
 Conversion rate of international marketing campaigns (CRIMC), tracks the percentage of prospective international

students who apply after engaging with marketing campaigns, which measures the efficiency of international marketing strategies in converting interest into applications.

$$CRIMC = \left(\frac{\text{International applicants}}{\text{Prospects engaged in campaign}} \right) \times 100$$

Percentage website traffic from international sources, measures the volume of website visits coming from international locations, indicating the effectiveness of promotion and digital marketing strategies aimed at global audiences.

$$\text{Percentage of website international traffic} = \left(\frac{\text{International web visitors}}{\text{Total website visitors}} \right) \times 100$$

Percentage of availability of international student accommodation (PAISA) monitors the percentage of available housing units allocated to international students which shows the adequacy of infrastructure dedicated to accommodating international students.

$$PAISA = \left(\frac{\text{Housing units for international students}}{\text{Total housing units}} \right) \times 100$$

Percentage of access to international support services (PAISS), monitors the percentage of international students with access to specific services such as counseling and language support which evaluates the institution's capacity to provide essential services to its international student population.

$$PAISS = \left(\frac{\text{International students using services}}{\text{Total international students}} \right) \times 100$$

Global brand name awareness index (GBAI), measures the awareness of university's brand name in international markets, especially in alignment with the university's internationalization goals. It counts the number of times the university is mentioned in international media, education industry websites, global website rank positions and social media verification.

$$GBAI = \left(\frac{\text{Number of international mentions of the university}}{\text{Total number of universities in target region}} \right) \times 100$$

Table 10: KPIs to monitor international management /governance criterion

Criterion	KPIs
International oriented management /governance	<ol style="list-style-type: none"> 1. Staff-to-International-Student Ratio 2. Training hours per staff member for internationalization 3. Percentage of budget dedicated to internationalization 4. Cost per international student 5. Funding for international research projects 6. Number of scholarships for international students 7. Conversion rate of international marketing campaigns 8. Percentage website traffic from international sources 9. Percentage of availability of international student accommodation 10. Percentage of access to international support services 11. Global brand name awareness index

5. Discussion

While this paper provides a comprehensive mapping of KPIs for evaluating and monitoring the internationalization of HEIs, there are limitations for future research. The literature review predominantly focuses on widely adopted metrics and may overlook emerging indicators driven by new global challenges, such as digital transformation and sustainability. Additionally, KPIs discussed may not fully capture the unique contexts of different regions or types of institutions, limiting their universal applicability.

Future research could explore context-specific KPIs of diverse institutional needs and investigate how emerging trends of virtual mobility, hybrid learning and cross-border partnerships reshape internationalization strategies.

6. Conclusion

Study answered the research questions by providing a

comprehensive mapping of ninety-six KPIs across nine distinct criteria for the evaluation and monitoring of internationalization of HEIs. These criteria cover essential dimensions such as student and faculty mobility, international research collaborations, institutional partnerships and curriculum internationalization. This mapping is a valuable tool for institutions to measure the effectiveness of their internationalization policies and practices, enabling continuous improvement and better alignment with international standards. Institutions can use this structured approach and to choose among the lists the appropriate KPIs not only to track progress but also to identify areas that need enhancement, optimize resource allocation, and increase their global visibility and impact. Moreover, the study underscores the significance of data-driven evaluation in the increasingly competitive global higher education landscape. Ultimately, the development

and monitoring of all or part of these KPIs contribute to the institutional mission of promoting a more international engaged and culturally diverse academic environment.

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