



Technology Enhanced Internationalization in Higher Education, Non-Traditional Indicators

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Abstract

This paper describes an alternative view of the internationalization process in higher education by comparing the traditional and non-traditional indicators on how the level of internationalization is measured; additionally, barriers that exist on both sides are reviewed and discussed. As higher education institutions are very accustomed to and focused on the number of international students, international cooperation agreements, visiting guest professors and international projects, another dimension could be added if we start to account and measure things that are happening in the digital communication, online data exchange, usage of mobile devices and other technologies. Authors argue that it would be necessary to include this perspective in the development of internationalization strategies, institutional development plans as well as external outreach tactics. The paper is based upon empirical knowledge coming from Erasmus+ KA2 project and a brief institutional self-assessment performed by Riga Technical University International Cooperation and Foreign Students Department.

Keywords: Internationalization; Digital Communication; Technology Indicators; International Outreach.

Introduction

Technology has become a very large and horizontal issue across various sectors, including higher education, due to explosive advancements in computer and mobile technologies that include both – hardware and software. It has penetrated all the processes happening in the universities, such as teaching, learning, research, and internationalization. Gao Y., Baik C., Arkoudis S. (2015) discussed the influence of globalization regarding internationalization and described the changing drivers for internationalization such as regionalization. P. Thiel in his book *Zero to one* argues that technology has a lot to do with vertical or innovative developments in society and that there is the opposite factor of globalization that is connected to horizontal or static development, using or upscaling the same knowledge without any novelty (Thiel, P. 2014).

Authors of this paper argue that the same thing is happening in higher education – globalization produces indicators for internationalization, such as more mobile students around the globe, bilateral or multilateral cooperation agreements, international projects, joint study programs, etc. and universities keep referring to them at any chance given. But if the technology is fostering innovation, then we should also advance it for the way we measure and see internationalization, because there are other indicators of internationalization that are directly connected to the technology. H. Chesbrough discussed the concept of open innovation and the need for close cooperation with various stakeholders to achieve novel solutions already in the early 2000s, giving examples on how heterodox ideas prevail when institutions break down the barriers of co-creation (Chesbrough H., 2003).

Internationalization is an ongoing process, not a target that can be just met and forgotten, it has to do with all layers of the institution, therefore instead of measuring how diverse is university's student community in terms of percentage or numbers, we should be addressing factors such as how good is the integration in the student community. These arguments bring a new conversation to the table – what kind of innovation can we achieve in internationalization? That is the question that authors are trying to answer throughout this paper.

Internationalisation and the need for indicators

The relevance of traditional indicators to assess the internationalisation

Even though internationalization has been a strategic and key issue for HEI over the last ten to fifteen years, there is not still one model for measuring internationalization these days. Policymakers, scholars, educators, researchers, and administrative staff are observing different indicators in relation to assessing the internationalization strategies of universities (Naveed, Q. N et al., 2020; Muhammad A., 2020).

Most of the aforementioned stakeholders often speak about internationalization in terms of the current level of internationality, showing as the key figures number of international students enrolled, number of publications and co-authored papers in international magazines, number of funded projects, international patents, international mobility, availability of joint and double degree, etc. Having all these traditional indicators in mind authors argue that the selection criteria of indicators should, therefore, refer to different rationales for internationalization and have to fulfill different criteria such as feasibility in terms of data availability and quality as well as should refer to the development of technology and digitization process, understanding opportunities for alternative indicators and limitations for traditional once. As far as all the aforementioned stakeholders are still bearing in mind that as long as we recognize that the outcomes of measuring internationalization are partial, it is still possible to debate and develop our trajectory in supporting strategic decisions over the university internationalization indicators during the digitalization period.

During this study, different lists of traditional indicators are considered. In this part of the article, the authors consider some of the key indicators and describe the essence and limitations of those, mainly demonstrating contributions and perceived value as well as discussing a popular term “international university”. The process of demonstrating some of the most relevant traditional indicators of internationalization led to the selection of five:

- International Networking
- International Mobility
- International Research Projects
- Number of International Students
- International co-authored papers

It is necessary to mention that the degree of internationalization even after fifteen years of studying this phenomenon to a great extent is associated with the input. According to Brandenburg U. (2007) when selecting indicators, you should consider your targets and whether the indicators can reasonably be acquired within time series. These time series state developments of the measured values., e.g. percentage growth, change in absolute figures over a time period. Green, M. F. (2012) presented ways to measure internationalization in terms of the goals that are set, including curriculum strengthening and quality of research. However, if we speak about international networking set as one of the “ostensible” indicators for internationalisation then it is necessary to mention that the number of partner and ERASMUS agreements are not so much significant in terms of quality and influence on the development and cannot be used as distinctive feature recognizing further outcomes. With no

doubt it can be included in the strategic planning in terms of defining the future partnership goals, but not as a key indicator for internationalisation.

The next indicator to be mentioned is the international mobility of academic, administrative staff, and students. Measuring the performance of internationalisation, the learning and teaching perspectives as well as courses provided, e.g. in English, are often given less importance. The degree of the academic and administrative staff involvement and commitment towards the process of internationalisation is usually underestimated. Therefore, it is of significant importance to assess and get regular feedback not only on the number of international mobilities realized but on the further feedback and development of cooperation with the partner universities. At this point, the term “international university” arises, which has various interpretations by different authors. For instance, J. Knight (2014) identified three generations of international universities. The first generation supports multiple international activities, such as student and staff mobility or joint programs with partners. The second one establishes branch campuses around the world. The third-generation university is usually funded by foreign partners. According to the Knight (2014) all of them in their internationalisation policies or strategies predominantly focus on the internationalisation dimension “abroad”. In this respect, De Wit (2017, p.27) notes that this focus on internationalisation “abroad” suggests that too many HEI still perceive internationalisation as a group of unrelated and fragmented activities. Although internationalisation is becoming a key issue on the science-policy agenda according to the European Science Foundation report, there is still little empirical evidence as to the level of internationalisation of research institutions, and the development of evaluation tools deserves special attention. Since 2005 and onwards the number of international students and the number of co-authored international papers has become not just an obvious indicator for measuring internationalisation, but a critical point or strategic target of every institution across the globe.

Hence, the debates above brought the authors to the decision to analyze the necessity of measuring alternative indicators taking into consideration technological and cultural factors and assessing the application of those indicators in different types of universities. Table 1 shows the main limitations the traditional indicators are encountering. Therefore, it is possible to assess various other means of measuring internationalisation without limiting the traditional one.

To summarize, the discussion of the abovementioned traditional indicators associated with internationalisation shows that due to some possible limitations the alternative indicators can and should be considered, especially, in the period of an increasing number of ICT tools and digitalization era.

Table 1. Overview and limitations of the selected traditional internationalization indicators

Indicator	Limitations
International Networking	The quantitative approach to measuring the number of agreements does not mean the quality of the output and influence on the internationalization itself. Lack of personalized approach towards common goals. Language barriers toward achieving common targets.
International Mobility	Obtaining the proper feedback after a mobility period within an exact time frame, e.g. development of further cooperation after one year. Lack of time for gathering information about the post-mobility experience after one-two years. Distance and accessibility should be pointed out as well while measuring internationalization.
International Research Projects	Accessibility and visibility of the research. Commitment and engagement are just limited to the number of projects, not the workload provided. Indicators are dependent on representation within a specific context. The necessity of alternative approaches to measuring internationalisation is obvious according to the European Science Foundation report.
Number of International Students	The number of international students is an outcome or the result of the process of internationalization. Therefore, the main limitations are set in the input provided to get those final numbers and visibility.
International co-authored papers	Availability of the data within and outside the university

Non-traditional indicators

International Association of Universities (<https://iau-aiu.net>) is analyzing trends and research about global developments in internationalization and it has helped universities to start a discussion about other possible ways to look at the internationalization process. Technology is often taken for granted by universities and is not considered by any means a measure of outcomes, rather just as a tool to facilitate processes in higher education institutions. It can be argued, that technology provided indicators have substantial potential for being measured to monitor the level of internationalization and add more specific perspectives on not only what international activities are happening in the higher education institution, but also how deep is an overall global integration, how qualitative is the internationalization process and where are areas of improvement. Here are seven example indicators presented by the authors of this paper:

Table 2. Examples of non-traditional indicators

Indicator	Means of obtaining	Interpretation
Number of e-mails sent to foreign email accounts (or specific countries, or in specific language)	Institutional or external e-mail service provider	Level of integration with international peers, colleagues, experts, partners in everyday life. E-mails have become the most used communication channel around the world and it has surpassed the physical meetings, calls or letters
Number of online video calls with foreign citizens	Software log files or self-made statistics	Seeing intensity of international distance communication gives more comprehensive overview on international cooperation, opposite to just counting business trips for example
Number of videos watched on internet in a foreign language	Playlists, routine diaries, self-made statistics	Introducing new formats of data allows to see in what setting university is working and there might be discoveries made about foreign language competencies, multimedia usage, common sources and more
Number of instant messages sent to international phone numbers	Conversation history logs, software-based statistics	Instant online messengers such as WhatsApp, Skype, WeChat, Viber has become a standard for fast response communication and measuring the levels of foreign outreach could show the everyday internationalization levels
Number of internet pages visited in a foreign language	Software log files or self-made statistics	Information and data flow are a two-way street and in case of academics and scientists, they often need to consult with the knowledge and findings from other countries and peers
Number of foreign study materials used in courses, references to foreign scientists in research papers	Software log files, academic and scientific databases or self-made statistics	This would reveal how internationalization flows through the process of teaching, learning and research
Number of files downloaded from the internet in a foreign language or foreign server	Data repository logs, self-statistics	Incoming data files from abroad could show where the information used by university staff is coming from and what is the local/foreign ratio

Indicators shown in table 2 shows examples that are related to using of technology and are possible to measure, but the list can be significantly larger, depending on ICT usage habits of each institution, capabilities of the systems that are in use, specific academic or scientific activities and more. These kinds of indicators would allow us to recognize unique factors in institutional internationalization, for example - one international project with specific countries is generating a significant amount of collaboration within the institution in a particular region, where 50 bilateral agreements are “sleeping” and not showing any activity.

If we take a look at the same limitations that the traditional indicators have attached to them, it becomes apparent that none of those limitations exist in technocratic point of view:

- Distance – not applicable.
- Language – can be solved by instant translation tools.
- Lack of time – flexibility allows us to manage time according to availability.
- Special needs – there are gadgets to assist almost all people who have special needs.
- Personalized approaches – automation and analytics allow tailor-made approaches.
- Feedback – seamless, closed feedback loops that don’t require significant efforts.
- Accessibility – no discrimination is made towards people from various backgrounds and possibilities.

Results and discussion

An empirical study of EU and Latin America

All three authors of this paper represent Riga Technical University which is a partner in the project “TIC CRUZ DEL SUR” (project reference number: 585879-EPP-1-2017-1-ES-EPPKA2-CBHE-JP), in frameworks of Erasmus+ KA2 Capacity Building in the higher education program. The project consortium consists of three universities from Latin America, coming from Honduras, Panama, and Argentina; and three universities from Europe, coming from Spain, Latvia, and Portugal. The main objective of the project is to enhance capacity for international cooperation between universities in Latin America’s least developed regions and universities in the EU, by facilitating the transfer of knowledge and best practice in transparency and recognition of the credits. Also, it aims at promoting the exchange of know-how and good practices among the partnership in technology, thus creating IT’s tools in the management of mobility programs and also internationalization related sub-processes. This experience has allowed us to see the numerous opportunities for technology-related indicators to be included in the overall picture of internationalization. By starting from the very beginning of how technology can support internationalization, many findings described in this article emerged and a discussion was held with colleagues from EU and Latin America on measuring internationalization. Traditional indicators were looked at and those were coherent with section 2.1 of this paper. Universities in Latin America described their experience with

student mobility, projects, and bilateral cooperation, but similar to EU partners all discussion participants agreed that those traditional indicators do not reveal the whole landscape and areas of internationalization. Here is the summary and key findings from the discussion held in the year 2019:

- Traditional indicators reveal high levels of students from Spanish speaking countries, cooperation agreements with Spanish speaking country institutions and networks, but non-traditional technological indicators reveal also significant activity towards non-Spanish speaking countries, which is not well surfaced by the traditional indicators.
- ICT systems used in universities do have capabilities to monitor and extract some of the non-traditional related information in a centralized manner, but there are no specific measures taken to configure systems to monitor those indicators, therefore in a pilot study, self-administered monitoring is one of the most relevant options.
- Institutional planning documents, development plans, and internationalization strategies are developed mostly around traditional indicators, therefore follow developments in those indicators, which can be misleading from the real situation from what is happening in each office daily.
- It would be beneficial to include a focus on non-traditional indicators when developing internationalization strategies as well as ICT systems in higher education institutions.

Statistical data of alternative indicators' analysis of Riga Technical University

Riga Technical University (RTU) is one of the leading public universities in Latvia. International engagement and the impact of internationalization has always been the RTU key issue for the last ten years. The RTU International Cooperation and Foreign Students Department researchers have been conducting different types of analysis (questionnaires and interviews) on the impact and effectiveness of measuring different indicators for internationalization and have concluded that some of the measuring indicators are impractical, either due to practical application or quality output those indicators are bringing into the play. Therefore, for the last three years, Riga Technical University International Cooperation and Foreign Students Department are conducting the self-assessment or analysis of alternative indicators' commitment towards improving the internationalization process measuring the possible non-traditional indicators and enhancing the internationalization vision and feasibility at the university administration level, improving the output data in the number of students, international activities, projects, etc. The analysis was conducted within the university, taking as respondents the RTU academic and administrative staff. For the last three years, the authors were conducting interviews and questionnaires with a hundred (100)

employees assessing the commitment towards non-traditional indicators as well as gathering quantitative information from the IT department and service providers. The employees were asked to conduct a self-assessment as well on the annual basis for several months and the IT department was asked to analyze several non-traditional indicators mentioned in Table 3.

Table 3. Informative statistics of assessing non-traditional indicators used by academic and administrative staff committed to internationalization process¹

Indicator	Monthly per person (2017)	Monthly per person (2018)	Monthly per person (2019)
Number of e-mails sent to foreign email accounts	23	97	224
Number of online video calls with foreign citizens	5	12	27
Number of videos watched on the internet in a foreign language	9	17	43
Number of instant messages sent to international phone numbers	13	28	69
Number of internet pages visited in a foreign language	67	129	227
Number of foreign study materials used in courses, references to foreign scientists in research papers	1	5	17
Number of files downloaded from the internet in a foreign language or foreign server	67	134	287

If we compare the increase of alternative indicators in numbers for the last three years with e.g. the number of international students' growth in Riga Technical University, then the substantial increase can be seen in Figure 1 for the last eight years.

By prioritizing the analysis and usage of ICT tools, improving the administrative and academic staff ICT literacy there was a substantial increase in the number of international students applying and studying in the RTU as well as the number of international projects and academic and administrative staff engagement into international activities increased as well.

1. The 30-day monthly period is taken into consideration while assessing the non-traditional indicators

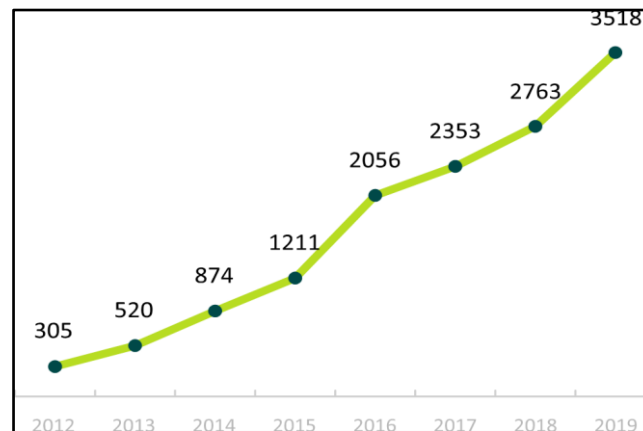


Figure 1. The increase of RTU international students

Conclusion

It has been surfaced that traditional ways of measuring internationalization have contrast among trends (Guri-Rosenblit S., 2015), which allows us to think that to some degree all the traditional indicators could use new additions. Considering findings in the literature, empirical analysis from international project with universities from EU and Latin America, as well as a case study from Riga Technical University, it is possible to conclude that non-traditional indicators do exist, can provide the important perspective of internationalization processes and they require an additional skillset from the people working in academia. The main skills that higher education institutions should be focusing on are:

- **ICT literacy**, to not only be able to use ICT tools but also develop, adjust, configure, and utilize maximum functionality from various ICT tools.
- **Communication literacy**, to be able to understand differences in how each generation communicates, establish the most appropriate channels, and have effective communication, including online communication.
- **Cultural literacy**, some of internationalization indicators could crash because of specific cultural aspects, therefore people in the higher education sector should be aware of them and be ready to take them into account.
- **Critical thinking**, as online communication is scaling up, so do fraudulent activities and false information, people should be able to recognize and filter this information.
- **Language** is an aspect that is diminishing thanks to the technological advancements (translation tools) and more people from younger generations being able to speak the

English language, but still, this is a competence that is quite important for internationalization.

Paper also confirms the correlation between traditional and non-traditional indicators, where they can complement and add to each other. At the same time confirmation was achieved to the thesis, that there is still a lot of mess in internationalization strategies of universities. Craciun D. (2018) researched national policies towards internationalization of higher education and had similar findings.

Future research topics connected to the subject of this paper are: ICT Business Intelligence software solutions, big data analysis for internationalization, student-led internationalization, in-depth analysis of technical indicators used in universities as well as regional case studies for non-traditional indicators.

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