



UNIVERSIDADE CATÓLICA PORTUGUESA

Impact: Identification and Measurement in Higher Education Institutions

Marta Moreira Oliveira

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Impact: Identification and Measurement in Higher Education Institutions

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Marta Moreira Oliveira

Under the guidance of

Professora Doutora Maria da Conceição Andrade Silva

Católica Porto Business School, Universidade Católica Portuguesa

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Resumo

Esta tese de mestrado investiga como é que as Instituições de Ensino Superior (IES), nomeadamente Business Schools, podem gerar e medir o seu impacto na sociedade. Ao reconhecer a influência que as universidades têm na sociedade para além da educação dos seus alunos, este estudo explora como é que as IES podem afetar uma grande proporção dos stakeholders através da sua investigação, práticas educacionais e atividades de alcance fora da universidade. Inspirada pelo modelo de impacto de Belcher and Halliwell (2021) e Erasmus University Rotterdam (2024b), esta tese define impacto como um efeito, mudança ou benefício nas diferentes áreas da academia, cultura, economia, ambiente, saúde, política, em termos sociais e tecnologia para construir um sistema que identifica e avalia o impacto que uma universidade pode ter na sociedade. O framework criado é aplicado na Católica Porto Business School (CPBS), onde um modelo customizado de avaliação de impacto é desenvolvido, refletindo a missão e os objetivos da universidade. Com dados da CPBS, três dashboards iterativos foram criados para avaliar os outputs e outcomes das atividades de investigação, educação e alcance. Os resultados realçam como é que as IES podem compreender, gerir e comunicar o seu valor para a sociedade através de uma abordagem estruturada para medir impacto.

Palavras-chave: Impacto, Instituições de Ensino Superior, Indicadores de Impacto, Investigação, Educação, Alcance, Outputs, Outcomes.

Nº de palavras: 10,000

Abstract

This thesis investigates how Higher Education Institutions (HEIs), particularly business schools, can generate and measure their impact on society. Recognizing that the influence of universities extends beyond education, this study explores how HEIs can affect a wide range of stakeholders through their research, educational practices, and outreach activities. By taking inspiration from the impact framework developed by Belcher and Halliwell (2021) and Erasmus University Rotterdam (2024b), we define impact as any effect, change, or benefit across domains such as academia, culture, economy, environment, health, policy, in social ways and technology, we construct a system to identify and assess impact within a university setting. The framework is then applied at Católica Porto Business School (CPBS), where a customized impact assessment model was developed, reflecting the institution's mission and objectives. Drawing on institutional data, three interactive dashboards were created to evaluate outputs and outcomes across research, education, and outreach. The results highlight how HEIs can better understand, manage, and communicate their value to society through a structured approach to impact measurement.

Keywords: Impact, High Education Institutions, Impact Indicators, Research, Education, Outreach, Outputs, Outcomes.

Word Count: 10,000

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1 Introduction

In today's world, Higher Education Institutions (HEIs) need to reflect on their influence on society and consider how their activities can generate positive societal impact.

Universities play a significant role in shaping the lives of their students through education, not only in the content they teach but also in how they assess, mentor, and prepare students for life beyond academia. However, their impact goes beyond education. Universities can also positively affect their students and external stakeholders through other activities such as research and outreach.

This thesis explores the different ways universities, particularly business schools, can generate impact and how that impact can be measured. In particular, it examines how universities can contribute to societal well-being through their core activities: education, research, and outreach. Academic research produced by HEIs plays a crucial role in addressing complex social and global challenges, offering valuable insights across diverse fields, and contributing to the development of new technologies, policies, and innovations. Also, outreach activities contribute to the creation of relationships with external partners which leads to knowledge exchange.

To assess this, we developed a framework capable of identifying and measuring the impact of HEIs grounded by the approach of Belcher and Halliwell (2021) and Erasmus University Rotterdam (2024b). In our study, we consider impact as the effect, change, or benefit resulting from university activities to the academy, culture, economy, environment, health, policy, technology, and society. We applied this framework at Católica Porto Business School (CPBS), designing a tailored impact assessment system that is aligned with the school's mission and strategic goals.

Although identifying impact in theoretical terms is relatively straightforward, measuring it in practice presents significant challenges. In this thesis, we aim to demonstrate practical approaches that a university can use to measure its impact – or at least the path leading to it. Using institutional data related to CPBS's research, education, and outreach activities, we developed three interactive dashboards – one for each activity – to monitor and evaluate selected outputs and outcomes representing different types of impact. In addition to quantitative indicators, we also present qualitative data to highlight the kinds of impact that can be generated but are not always easily captured through numbers by itself.

2 Literature Review

It is essential that universities start to understand how they can have a positive impact on society and how they can measure it. While it is evident that schools can achieve a positive impact by educating their students, how they can make a positive societal difference still remains unclear.

2.1 Defining Impact

How can we define the impact that universities have on the society?

HEIs are generally divided into three main activities: Research, Education and Outreach (see Erasmus University Rotterdam (2023a) (EUR), Berchin et al. (2018), Berchin et al. (2021), Findler et al. (2018), Guerra et al. (2016), Azeiteiro et al. (2015), Hoover and Harder (2015)). These activities can have a fundamental role in transforming societies (Ramos et al. (2015)).

EUR contributes to a positive societal impact through their three core activities:

- **Education:** with workshops, master classes, summer schools, online education, and internships;
- **Research:** publications for wider audiences, science communication, design research, innovations, licenses, and patents;
- **Societal engagement:** with entrepreneurship, academic consultancy, the contribution to public debate, policy advice, expert roles, media appearances, events, and community services.

Each of these activities has the potential to generate some sort of impact of various types. Many frameworks in the literature focus on just one of these activities: Research (see UK Research and Innovation (2025), LBG Open Innovation In Science Center (2021), Australian Research Council (ARC) (2025), Economic and Social Research Council (2021), Universidade NOVA de Lisboa (2024)).

There is no clear definition of impact, since it varies with the source. The impact of HEIs is commonly associated with the impact generated by research. However, some authors define impact as achieved not only through research but in a more general way. Some authors even name impact as societal impact (Erasmus University Rotterdam (2023b), LBG Open Innovation In Science Center (2021), AACSB International (2025)). In what follows, we will consider all these impact definitions as inherent in the same construct, meaning that a HEI can achieve

impact through an activity that can produce a long-term change, effect, or benefit. This impact can therefore be of various types and can be achieved through different forms.

Belcher and Halliwell (2021) define impact as an overarching term to denote any change caused, wholly or partly, by an action or set of actions, including research actions.

It is important to know what type of impact we want the university to achieve for society, as impact can also be negative. The quotidian definition of impact is “to have a strong effect or influence on a situation or person” (Press (nd)) which is often related to a negative impact.

According to EUR, HEIs can achieve a positive societal impact if they make a (sustainable) contribution to the better understanding of societal issues and the capacity to deal with them through their three main activities where its principal members are the students, professors and societal partners (Erasmus University Rotterdam (2023a,b)). For EUR, impact is a challenging, multi-faceted concept that differs between and within disciplines and research projects (Erasmus University Rotterdam (2024b)). This definition is especially intriguing since it correlates the core activities of a university with the creation of impact. It also highlights positive impact rather than just impact.

The most widely cited definitions of research impact come from the UK Research and Innovation (2025) – “an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia” with the belief that research impact will be positive and that researchers should be able to articulate these effects with related socio-economic benefits (see also Australian Research Council (ARC) (2025) and UKRI Economic and Social Research Council (ESRC) (2025)).

Finally, LBG Open Innovation In Science Center (2021) provides another definition of research impact, and names it as societal impact. The new ideas that this definition puts forward is that it relates research impact to innovation, the creation and transfer of new knowledge, the enhancement of quality of life and health, among others.

2.2 Types of Impact

How can we define each type of impact and the ways of creating it?

According to Erasmus University Rotterdam (2023a,b) and Belcher and et al. (2020), we can achieve impact through different forms: conceptual, knowledge culture, instrumental, network, capacity building, and transformational change. This type of typology is coherent with the literature from LBG Open Innovation In Science Center (2021), Edwards and Meagher (2020), UKRI Economic and Social Research Council (ESRC) (2025) and Nova School of Business and Economics (2022).

- **Capacity building:** Our actions empower individuals or groups by enhancing their ability to take meaningful actions on societal challenges. This involves long-term transformations via the development of new skills, expertise, and learning environments, such as training for students and professionals. Focuses on both technical and personal growth to enable effective responses to complex issues.
- **Conceptual:** Our actions lead to a deeper understanding of societal issues by examining them from multiple perspectives. This includes changes in knowledge, awareness, attitudes, or emotions that help individuals or groups better comprehend complex problems. These subtle changes can result in significant and impactful consequences for specific stakeholder groups or individuals.
- **Instrumental:** Our actions generate tangible tools or resources to address societal challenges or help others in decision-making. These outputs can take the form of plans, protocols, policies, guidelines, or practices that directly influence actions and decision-making processes, and shape legislation.
- **Knowledge culture:** Our actions influence the attitudes and behaviors towards knowledge exchange and societal impact. This includes fostering a culture where people are more open to reflection, collaboration, and developing alternative ways to define and address societal issues. This impact is reflected in increased willingness to engage in partnerships, participate in collaborative initiatives, and form new teams.
- **Network:** Our actions help establish and strengthen networks of people and organizations, enhancing social cohesion and improving collective capacity to address societal issues. This includes fostering relationships built on trust and collaboration. Examples include joint proposals, workshops, reciprocal visits, and sustained partnerships across disciplines or organizations, leading to enduring connectivity which can change the number and quality of relationships and trust.
- **Transformational Change:** Our actions contribute to or directly achieve profound and systemic changes in society, such as lasting improvements in social, economic, cultural, technological, or environmental systems.

Finally, according to the Universidade NOVA de Lisboa (2024) nine and Erasmus University Rotterdam (2024a) eight categories of impact we show below a description for each type of impact. We decided to present only eight different types: academic, cultural, economic, environmental, on health, political/legal, social, and technological. This type of typology is coherent with the literature from Findler et al. (2018) and UK Research and Innovation (2025).

Note that the category “Political/Legal” was combined to make the definitions simpler. In Universidade NOVA de Lisboa (2024) (UNL) they use just political impact and in Erasmus University Rotterdam (2024a) they use two distinct categories: one for legal impact and another for policy impact. Also, UNL considers academic and educational impact where we are only going to consider academic impact (which includes both academic and educational impact), following EUR categorization.

- **Academic:** Expanding knowledge (contributing to advances in methods, theory and applications) and fostering new ideas, curricula, pedagogical tools, qualifications, the formation of disciplines, and training. Increase researchers’ reputation and security funding by having impact as a metric of quality and productivity.
- **Cultural:** Enhancing people’s understanding of culturally different ideas, beliefs, and values. Preserving heritage, fostering new expressions, and understanding communities.
- **Economic:** At the micro-level the contribution to the creation of quality jobs, generating products/services, improving profits or efficiency. At the macro level the contribution to stimulating economic growth.
- **Environmental:** Supporting environmental sustainability. Reducing emissions, managing resources, and raising awareness about environmental problems and climate crisis.
- **Health:** Improving health and well-being, life expectancy, public health, and illness prevention. Developing drugs, therapies, and healthcare access.
- **Political/Legal:** Contributing to policy improvement. Advancing law enforcement, legislative change, and justice access. Influencing, informing and improving decision-making by the government and enhancing public/private sector services.
- **Social:** Enhancing welfare, equality, inclusion, and quality of life. Addressing societal problems by developing new solutions.
- **Technological:** Developing new and improving existing technologies by the innovation and improvement of products, processes, and services.

2.3 Impact Evaluation Methods

For such a complex and hard to define concept, it is no surprise that the measurement and evaluation of impact is also complex. According to Reed et al. (2021) there are five different methods of evaluating impact:

- **Experimental and statistical methods:** used in summative evaluations to assess whether research is a direct cause of the impact. They focus on establishing causal relationships between research and specific outcomes. Examples: Statistical modeling, longitudinal analysis, and econometrics.
- **System Analysis Methods:** used in both formative and summative evaluations (ex-post or during the pathway to impact). They trace the links between causes and effects along the pathways to impact, examining how different factors and processes contribute to the final outcome. Examples: Contribution analysis, social network analysis, Bayesian networks, and dynamic system models.
- **Textual, oral and arts-based methods:** used in formative evaluation to involve beneficiaries in creating feedback that enhances impact or in summative mode (ex-post) to assess the research's contribution to impact. They provide qualitative insights into how research influences people and communities, including subjective, cultural, and personal perspectives to argue that research was a necessary cause of impact. This approach may involve direct engagement with stakeholders to have the evidence. Examples: Testimonials, ethnography, participant observation, interviews, focus groups, media analysis, storytelling (see Chapter 2.4).
- **Indicator-Based Approaches:** use indicators to measure progress towards anticipated impacts. Used in summative or formative evaluations and it is typically ex-ante. They assess how research contributes to the achievement of specific outcomes. Causal processes are traced from the generation of research to its broader impacts. It examines how research interacts with mediating factors and contexts that contribute to change. Examples: Theory of Change (see Chapter 2.4), Logical Framework Analysis, Payback Framework, SIAMPI Project (see Chapter 2.4).
- **Evidence Synthesis Approaches:** used in summative mode to aggregate evidence from various sources to estimate the impact of a specific intervention or research activity across different contexts. Systematically aggregates and analyzes evidence from multiple evaluations, using this combined data to infer the causal relationships across different settings. Examples: Meta-analysis, narrative, realist-based, and rapid evidence synthesis.

In the next presented frameworks of impact these methods can be visible in an isolated or jointly way.

2.4 Frameworks

Several frameworks try to identify and measure the impact that HEIs have on the society. Theory of Change (ToC) is a formative, iterative, non-linear process and evaluation method done at the beginning or during a project to inform or improve its design or process (Frey (2018)). The elements of creating a ToC are the goal(s) your work is contributing to, the main actors involved in the process, the main activities, their resulting outputs that lead to the outcomes, and the originated impact. So, the sequence of impact creation (impact pathway) is: activities → outputs → outcomes → impact. Impact activities should always be chosen with the overall aim of the project in mind since one expects the output from an activity to work in support of the outcome that is going to create the impact.

Belcher and Halliwell (2021) describe this process through three different spheres: control, influence and interest (see Figure 1). The sphere of control is what the project does directly – activities and outputs. The sphere of influence is who the project works with and it includes the outcomes of a project that can contribute to instrumental, conceptual, capacity building, network, and knowledge culture changes (see Chapter 2.2). And finally, the sphere of interest is the improved conditions that the project seeks to reach outside of its influence – the realized benefits (impact).

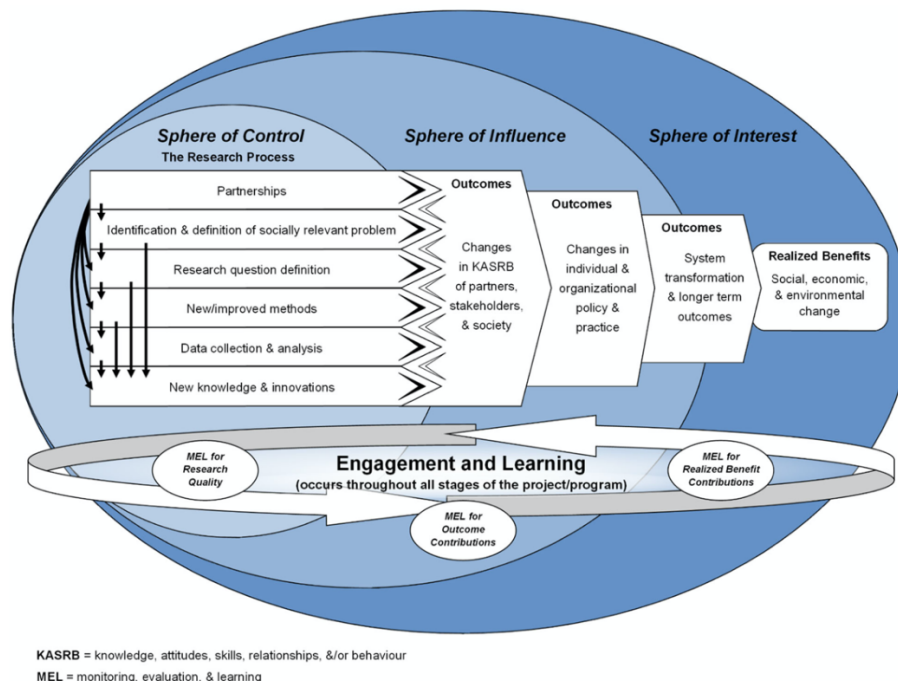


Figure 1: Generic Research Theory of Change - Belcher and Halliwell (2021)

Just like Belcher and Halliwell (2021), EUR starts with a ToC that is a constant stakeholder dialogue between resources/inputs, activities, outputs, outcomes and, finally impact. According to professor Arwin of EUR, impact evaluation involves understanding the ToC and what

mechanisms are at work to get a certain impact. EUR recommends starting by considering the overall impact ambition – the societal change you are hoping to achieve. Then, relate this to a specific thematic type of impact, which allows to consider more specific context indicators. After this, think of your mission and formulate what type of outcomes you hope to achieve.

According to EUR, outcomes concern medium-term results and usually have a clear relationship with the purpose of the academic project. They can be understood as intermediate steps towards longer-term impacts. The term “outcome” is frequently used as “impact”, but these terms are distinguished by the degree, directness, scale, and duration of change (Belcher and Halliwell (2021)). An outcome is a short-term or medium-term effect of an intervention’s outputs, while impact denotes a long-term effect produced by a development intervention (OECD-DAC (2010)).

After thinking about the outcomes to achieve, HEIs need to plan the kind of outputs they need to attain their mission. Outputs are the most immediate result of an activity (Belcher et al. (2020)). Therefore, countable and tangible outputs produced by academic work should be formulated and it might vary depending on the kind of change aimed.

Finally, HEIs need to start preparing which activities must be performed to achieve the desired outputs. Activities are understood as the hands-on practical activities that your project can do to reach the desired change (Belcher et al. (2020)). By working from an impact level to an activities level, it is possible to have the bigger picture of the project in mind and therefore make more strategic decisions about the activities and outputs needed throughout the process.

According to the ToC, there is a belief that engaging with stakeholders throughout the pathway to impact increases the chance for productive interactions which may lead to impact. EUR thrives for building sustainable relationships with its stakeholders and society to create ways to solve its challenges (Erasmus University Rotterdam (2023b, 2024b)). They do this by not only educating their students but also through collaboration with others, trying to change their mindsets from the dissemination to the exchange of knowledge. Erasmus University Rotterdam (2023a) created the concept of impact-driven education which provides students the capacity to have a positive societal impact during and after their study at EUR making them develop the necessary skills to deal with societal issues (impact capacity).

As in the traditional form of teaching, professors provide knowledge and insights to their students. However, they also need to provide them with coaching, guidance and support which increase students’ interactions with the outer world (Erasmus University Rotterdam (2023a)). Also, students and teachers must interact with societal partners to understand and deal with societal problems.

Co-production is referred to as a collaborative approach between researchers and non-

academic stakeholders which strengthens engagement and facilitates the adoption of research findings (LBG Open Innovation In Science Center (2021)). By involving stakeholders throughout the research process, co-production ensures that outputs are more relevant, actionable, and aligned with societal needs (Phipps et al. (2016) and Spaapen et al. (2011)).

The SIAMPI project defines these productive interactions (Spaapen et al. (2011)) as exchanges between researchers and stakeholders that produce scientifically robust and socially relevant knowledge. These interactions – whether direct (e.g., personal exchanges, such as dialogues and consultations), indirect (e.g., publications or exhibitions), or financial (e.g., facilitated by economic exchanges or funding relationships) – serve as the conduits through which research findings are co-produced, validated, and translated into actionable outcomes. Such interactions not only enhance the credibility and utility of research but also foster mutual influence, enabling both scientific and societal stakeholders to benefit from the process.

These definitions advocate for transitioning from traditional “knowledge transfer” to “knowledge exchange”, fostering adaptive and collaborative research environments (Davies et al. (2008) and Boaz et al. (2019)).

EUR has a project called Evaluating Societal Impact (ESI) that aims to design and implement a broadly supported framework (methods, tools, templates, etc.) for evaluating societal impact that is consistent with the university’s identity. ESI covers three main areas:

- **Impact evaluation and activities:** Develop frameworks, indicators, tools, and templates for impact evaluation. Researchers can engage in activities like professional training, commercialization, policy advice, science communication, stakeholder dialogues, co-creation, and citizen science, tailored to societal sectors and disciplines.
- **Impact ambition and strategy:** Provide templates, strategy-building tools, knowledge sharing, advice, and peer review. An impact ambition outlines societal challenges, beneficiaries, intermediaries, interaction mechanisms, and desired change.
- **Impact environment and capacity:** Share impact evaluation knowledge, offer advice, and host workshops on formulating an impact strategy and ToC. Achieving impact requires an organizational strategy, infrastructure, and impact-literate and supportive staff. Impact literacy, as defined by Bayley and Phipps (2019), involves the ability “to identify appropriate impact goals and indicators, critically appraise and optimize impact pathways, and reflect on the skills needed to tailor approaches across contexts”:
 1. Identifying, assessing, evidencing, and articulating impact endpoints (“what?”);
 2. Understanding and applying impact-generating practices (“how?”);
 3. Integrating these practices effectively by research impact practitioners (“who?”).

Another framework that assesses HEIs impact is the AACSB accreditation framework. Earning AACSB accreditation shows the commitment of a business school to strategic management, learner success, thought leadership, and societal impact (AACSB International (2025)). Business schools achieve this accreditation as innovators in education, research, and societal impact.

To maintain their classification as Scholarly Academics under AACSB standards, faculty must produce a specific number of publications within a period. AACSB staff managers adopt different professional development approaches based on each professor's intellectual contribution portfolio, ensuring faculty members continue to grow in ways that align with their strengths and the school's broader societal impact goals.

Holmgren and Kringelum (2024) suggest that schools can increase their impact by refining faculty qualification criteria and strengthening support systems in line with accreditation efforts. One of the most effective ways for universities to achieve this is by closely aligning faculty career development with societal impact requirements to enhance the school's contributions to society since professors often have difficulties in balancing their contributions to the university and improving their academic careers.

By fostering research that contributes to society's development, the school strengthens its impact-driven mission and tailors career development strategies to align faculty contributions with institutional goals. This integration highlights how business schools can use accreditation standards to embed societal impact into faculty classifications, enhance intellectual contributions, and promote broader societal change.

Guided by the AACSB accreditation standards, Aalborg University Business School implemented a strategy integrating faculty development with societal impact through three critical steps: clarifying promotion criteria, systematically documenting research contributions, and providing personalized support via staff managers. This approach allowed the school to establish a framework for assessing faculty impact across four dimensions:

- **Academic Impact:** focuses on traditional scholarly outputs, such as peer-reviewed publications, books, external research funding, keynote presentations, and organizing academic events. Produces internationally recognized and often interdisciplinary research on contemporary issues that push the boundaries of knowledge toward new and enhanced business practices.
- **Educational Impact:** highlights contributions to teaching and learning, including case studies, interdisciplinary problem-based learning, guest lectures, and creating teaching materials. These activities aim to develop lifelong learners and equip students with advanced business knowledge.

- **Business Impact:** measures collaboration with private and public organizations, including consultancy projects, research partnerships, industry-focused publications, and advisory roles. This dimension promotes knowledge exchange and practical applications that benefit businesses and the economy.
- **Public Impact:** includes broader societal engagement, such as policy contributions, media presence, participation in committees, and dissemination of research through non-traditional formats like webinars and podcasts. These activities seek to influence public discourse and address societal challenges.

To measure these impacts, the school uses a research management system (PURE) to document and categorize their contributions across the four dimensions. See also University of Bath (2024) which gives examples of activities and research outputs associated with the pathway to impact and where to enter them in PURE. The metrics are then used to assess individual and collective performance, track alignment with strategic goals, and ensure compliance with AACSB accreditation standards. Faculty impact profiles are created based on this data, providing insights into strengths and areas for development, and fostering an impact-driven academic culture.

Other known framework is the Research Excellence Framework (REF) implemented by the Higher Education Funding Council for England (HEFCE), now replaced by the UKRI (UK Research and Innovation (2029)). REF emphasizes not only on academic quality but also on the societal impact of research. REF suggests the use of “impact statements” or “impact narratives” to demonstrate the significance of research outcomes beyond academic research (LBG Open Innovation In Science Center (2021)). It provides an outline for developing impact statements and structuring them as a series of free-text case studies. Each case study demonstrates a specific example of impact which is guided by a template of suggested indicators provided by the institution. Both contain draft templates for case studies that can be adapted to develop documentation and guidelines to write impact statements for individual staff members. REF asserts that within each case study, the range and significance of impact gained throughout the process should be discussed, using examples that are easily identifiable, supportable, and evidence-based. This demonstrates that qualitative analysis can be as a reliable measure of a scholar’s work as quantitative tools (LBG Open Innovation In Science Center (2021)). University of Galway (nd) states that “Research impact narratives are powerful tools used to communicate the tangible outcomes and benefits of research to various stakeholders, including policymakers, funding agencies, and the public. They highlight how research has made a difference in the real world and can be used to demonstrate the value and significance of research findings”.

Finally, the QS Stars method assesses universities based on rankings (QS Top Universities

(2024)). With the Stars Rating System universities can be assessed from 1 to 5 stars in an overall way or based on specific categories (see Figure 2)). To get an overall rating a university must meet some prerequisites like having a specific rating in each category. The overall ratings can be satisfactory (1 star), moderate (2 stars), good (3 stars), very good (4 stars), excellent (5 stars) and outstanding (5+ stars).

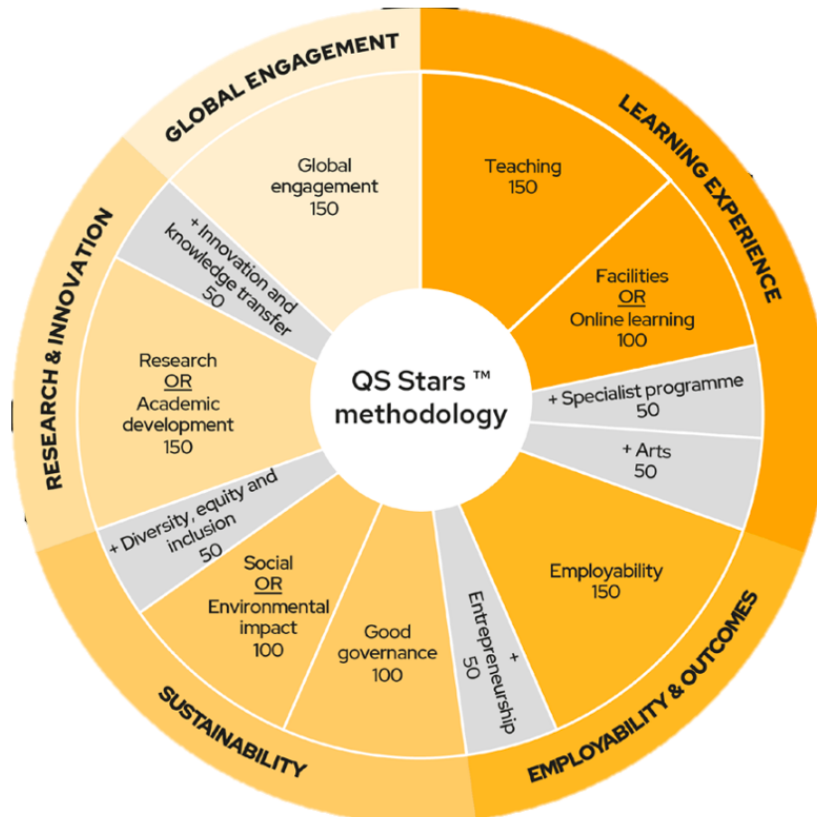


Figure 2: Stars Rating System - QS Top Universities (2024)

The categories and subcategories in which a university can be assessed in are seen in Figure 2. Some categories have a maximum of 50 points, 100 points or 150 points. This means that a university needs a maximum of x points to reach 5 stars in a single category. It makes sense that it will be more difficult to reach 5 stars in the categories with a maximum of 150 points since the university needs more points to reach 1 star (15 points) than in the categories that have a maximum of 50 points (5 points for 1 star). Each category has some criteria, for example, to gain 40 points in the teaching category, the university needs to have a 10% faculty-student ratio (one faculty member per 10 students) scaled down to 2% (one faculty member per 50 students). For instance, in the category of employability, to gain 40 points there needs to be a 90% scaled down to 50% of graduates employed or that started a business within 24 months of graduation.

2.5 Problems of current impact evaluation frameworks

According to Universidade NOVA de Lisboa (2024), there are some misconceptions about impact:

- **Limited to Academic Outputs:** Academic publications represent only part of the research impact, excluding broader societal and practical outcomes, such as influencing policies or benefiting communities.
- **Short-term Focus:** Research impact often takes years or decades to unfold. Evaluations should consider long-term societal and practical outcomes.
- **Linear Relationship:** Research impact does not always follow a direct path since it is shaped by complex and multifaceted factors. Research findings may be interpreted differently by different stakeholders, and be influenced by political, environmental, and societal values.
- **One-size-fits-all Definition:** Impact differs across disciplines from being measured by advancing theoretical knowledge to solving practical problems, so it must be evaluated in the appropriate context.
- **Sole Responsibility of Researchers:** Researchers are not solely responsible for achieving impact from their research. Achieving impact is a collective effort requiring collaboration with stakeholders, such as policymakers, practitioners, and communities, alongside researchers.

When assessing societal impact the main challenge is the causality problem. This is the difficulty in attributing specific social changes to particular research activities (Felt and Fochler (2018); Smith et al. (2020)). Social transformations often result from complex configurations of factors, making direct causal links difficult to establish. Moreover, the time frame issue complicates evaluations, as the societal benefits of research may unfold over extended periods, often beyond the typical assessment windows. This creates a tension between short-term evaluation demands and the long-term nature of meaningful societal change (Bornmann (2013)).

According to Reed and et al. (2021), many members of the university community are not properly rewarded since research outputs are assessed according to criteria that doesn't have a long-term impact, but rather a short-term one (e.g. number of cited articles). The emphasis on the outputs of research instead of its longer-term outcomes (also known as impact) is harming individual staff career development and promotion. Smith et al. (2013) found that bibliometric measures of impact are problematic and biased emphasizing the need for impact to

be considered within research quality measures. However, there are still very few frameworks that measure and report impact as an indicator of academic excellence.

A key inherent in these frameworks is that impact must be demonstrable. A focus on activities and outputs that foster impact, such as organizing a conference and workshops or publishing a report, is not sufficient. There must be evidence of impact being used, such as by policymakers and practitioners which lead to improvements in services, products, or businesses (Reed (2016)). In the next chapter, we will present our framework inspired by this literature that identifies and measures the impact that HEIs can and must have on society.

3 Methodology

This thesis adopts a design-based research methodology with a focus on the development of a framework that identifies and measures university impact directly or indirectly. The research integrates both theoretical and practical application and analysis, aiming to create a system that can be used by a university to evaluate its impact. The design process includes the creation of an impact framework and its application in Católica Porto Business School. The framework was created based on the literature and its design was produced using Canva. It was developed through an iterative process, involving the identification of key performance indicators (KPIs) divided in the research, education and outreach activities of a university.

Our thesis is divided in two parts: the theoretical explanation and design of the impact framework, and the practical application of it into data visualization methods for better data analysis. The goal was to create a framework that identifies and measures impact showing in practice its implementation with real data.

The type of study that will be performed is quantitative and qualitative. Quantitative since we used some indicators from the developed framework (Chapter 4.3) to create a new framework tailored to CPBS that allowed easy integration with the university's existing data sources, ensuring that it could be scalable and adaptable to measure its impact in every category (Table 4). We also used a qualitative approach to show some activities that the school presents on its website and impact narratives written by CPBS researchers.

The data for this thesis was provided by CPBS which has information regarding their education, research, and outreach activities. The preparation of the collected data involved data cleaning with the removal of inconsistencies, missing values, and outliers ensuring an accurate and reliable analysis, and its transformation with data standardization creating a uniform format for analysis.

Once the data was cleaned, three dashboards (one for each activity - based on Tables 1, 2 and 3 in Chapter 4.3) were created. These dashboards were built using Power BI and were tailored to the specific needs of the university. These dashboards were designed with interactivity in mind, enabling users to filter data, drill down into specific areas of interest, and export data for further analysis.

The quantitative data analysis primarily involved examining how the dashboards could be used to derive meaningful conclusions from the university's data. This included descriptive analysis, by analyzing the trends in the data, such as average student performance, research outputs, and societal engagement, and by measuring how well the dashboards helped in decision-making by identifying key areas of improvement.

4 Impact Framework for HEIs

Our impact framework defines impact as the effects, changes, or benefits to society in academic, cultural, economic, environmental, health, political, social, and technological ways caused by the research, education, and outreach activities of HEIs.

For the development of this framework, we considered the approach from Belcher and Halliwell (2021) and Erasmus University Rotterdam (2024b), using the Theory of Change as an inspiration. Our framework will also evaluate the impact based on the indicator-based approach and the textual, oral and arts-based method defined by Reed and et al. (2021).

4.1 Description

Combining the ToC with our understanding, the pathway to impact follows the subsequent steps: inputs, activities, outputs, outcomes, and impact (See Figure 3). What can be very fascinating is the bridge that can be made between the pathway to impact and the concept of setting efficient (that transform inputs into outputs) and effective (in transforming outputs into desired outcomes) activities that can, through a number of medium-term changes (outcomes) lead to a longer-term change (the impact).

Just like Belcher and et al. (2020), we see the capacity building, conceptual, instrumental, network and knowledge culture concepts as the outcomes caused by the outputs of the activities before the impact is made. In other words, we see these concepts as medium-term changes that happen to give rise to the impact. These are the forms of impact, defining 'HOW' the impact will be achieved from a set of outcomes. Then these outcomes will eventually lead to the impact that can be divided in eight different types related to 'WHERE' the impact happened.

Our framework is divided in two parts: physical flux (in white) and strategic flux (in blue) - Figure 3. **Strategic Flux:** Before measuring the desired impact with the physical flux, we need to define what type of impact we want to create. After that, we can start planning the outcomes we are going to need to eventually achieve the desired impact. Then, we need to plot the outputs that will generate those outcomes, and then prepare the activities that would produce those outputs. Finally, we simply need the inputs to do the required activities. **Physical Flux:** After the strategic plan is prepared we can start estimating the steps towards impact. To measure impact we need to follow a bottom-up procedure. We start by measuring our inputs, the activities we are going to make with those inputs, the generated outputs, and, finally, the consequent outcomes that will eventually lead to a type of impact.

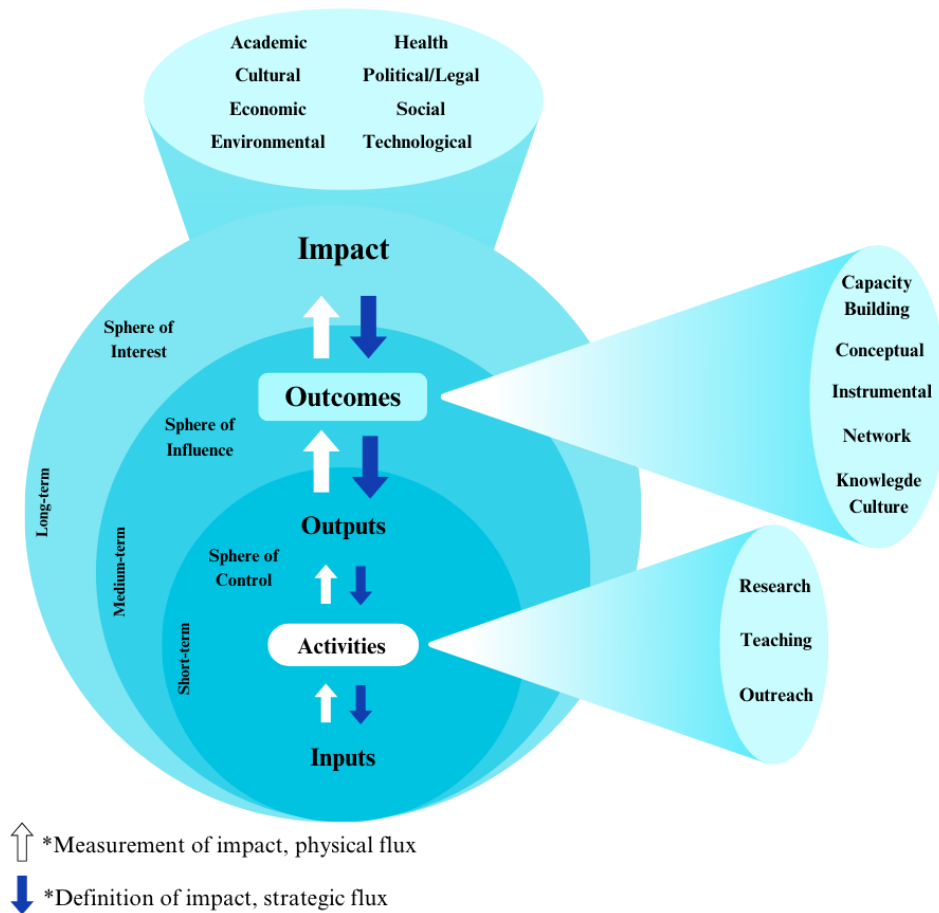


Figure 3: Impact Framework for HEIs

The bottom-up approach assumes that the impact will exist, whether it is intended or not. However, the creation of a specific type of impact implies a top-down approach that starts with the strategic definition of the type of impact we would like to achieve and the subsequent steps to follow.

The level of abstraction/subjectivity increases when we go from outputs to outcomes to impact, simultaneously the level of influence and quantification decreases. In line with what was stated by Belcher and et al. (2020), inputs, activities and outputs are inside the sphere of control since HEIs have direct influence over them. A university has the control over the type of research it makes, the way it educates/teaches its students, and the way it reaches the people outside the organization. While outputs can be directly influenced by the type of activity that the university chooses to do, the outcomes are indirectly influenced by it. Therefore, outcomes are in the sphere of influence, because they depend on the activity outputs and not on the activity by itself. Outcomes are the medium-term changes that are caused by the outputs, for example, the changes in actions, knowledge, practices, behaviors, emotions and policies, the changes in knowledge exchange, the development of new skills and expertise, among others (see Chapter 2.2). Finally, impact belongs in the sphere of interest where it can't be directly

influenced since it may or may not happen according to what the university had planned. But if it cannot be fully achieved as planned, why pursue it at all? Because it is still better for a university to track the aspects it can control and that align with the type of impact it aims to generate, rather than doing nothing which risks allowing impact to occur unintentionally or without direction.

4.2 Evaluation

When Thomas Edison tried to create the lamp, it took him more than one thousand trials. But what if he had given up on the 100th? He would have never known that he was contributing to the invention of the bulb and it wouldn't have created the high impact it caused on society. Fortunately, Edison didn't give up and thanks to him we can see at night.

Universities must start to understand how they can have an impact on society and how they can measure it to comprehend if they are on the right path. Universities contribute to the creation of high qualified students and entrepreneurs with its professors being specialized in different research areas. Thus, the main activities of a HEI (research, education and outreach) can have an impact on a specific area/type. For example, these activities can have an impact on the quality service of a hospital (impact on health), or the creation of a new policy improving women's rights (political impact). Some other examples include impacts on the environment created through online learning that can contribute to climate change mitigation and the reduction of greenhouse gas emissions (Versteijlen et al. (2017)), the national and international students causing in-migration, demographic change, and cultural dialogue (Hubbard (2008) and Yao and Bai (2008)), and students' individual activities or behaviors – students with entrepreneurial attitudes – may contribute to business creation and thus strengthen local economies.

4.3 Indicators

Coming back to the Thomas Edison example, how can we measure his impact? Can it be measure by how many people use light bulbs in the world? Well, that is everyone. But that is a good way to start. We should start by planning out what type of impact we want to create and then deconstruct the necessary steps. We should consider what activities we can do to contribute to an output that will lead to an outcome and eventually create impact. For example, if I want to create impact on the quality of life of the public hospital patients, I should start by planning the activities I can do to increase the efficiency of processes to reduce waiting times (output) that will lead to more treated patients on time (outcome) and increase their quality of life (impact). This can be measured by the average waiting time per patient, number of patients'

appointments per hour, and number of deaths due to waiting time.

A great analogy that can be made for the identification and measurement of impact is with the baking of a cake. The inputs necessary to bake a cake are flour, sugar, eggs, an oven, a baker, among others. The activity is baking the cake: gathering the ingredients and putting it in the oven. The obvious output is the cake. But it can also be the time it took to bake the cake, the great smell of the kitchen, the used dishes, the leftovers of the ingredients, and the sensations caused when eating the cake. The outcomes can be the knowledge acquired when baking the cake due to some mistakes made in the process (conceptual), the created bonds with people when eating the cake together (network), the published recipe of the cake due to its successful taste (instrumental), the new skills gained from the improvement of the recipe (capacity building), and the changed mindsets from eating a cake made by a different culture (knowledge culture). All of these outputs and outcomes can generate a type of impact, which can be on the health and well-being of the people who ate the cake, or even on the economy due to the unique recipe that led to the creation of a production factory and jobs. It's important to mention that these impacts can be correlated or not with the impact initially intended by the baker.

It is important to select and apply indicators for impact evaluation (Hicks et al. (2015)). Impact indicators can help monitor outputs and outcomes in relation to an intended impact. Some indicators are quantifiable, such as citations in policy papers, prizes, or grants. Qualitative indicators are equally important as pathways to impact, such as productive interactions with non-academic stakeholders and knowledge acquired from students.

Indicators are context-dependent, meaning there is no "one-size-fits-all" indicator. Indicators can be used in various settings with different intentions and timings. This underlines the importance in considering with what intention impact indicators are used in what context (Erasmus University Rotterdam (2024b)).

With inspiration from the literature, our framework selects eight different types of impact that can be reached by HEI: Academic, Cultural, Economic, Environmental, on Health, Political/Legal, Social, and Technological. We also identified three core activities that universities do intentionally or not to create impact: research, education, and outreach.

But how can we measure each type of impact per activity?

For HEIs being able to measure their each type of impact we propose the following indicators (based on Erasmus University Rotterdam (2024a), QS Top Universities (2024) and AACSB International (2025)):

Table 1: Research Indicators

Inputs	Activities	Outputs	Outcomes	Impact
Professors and Staff	Research	Research funds obtained; N ^o of researchers' books used by students; N ^o of peer-reviewed articles; Revenue from research (patents, licenses, projects); N ^o of consultancy or for-profit centers that focus on or use research; N ^o of papers classified by ABS; N ^o of investigation centers.	Capacity Building: N ^o of programs that form PHD students; Conceptual: Average grade of students who study with researcher/professor's books. Instrumental: N ^o of joint productions and/ or university research collaborations producing publications in Scopus; N ^o of citations in Scopus; N ^o of investigation centers and patent products created; Development of new treatments and vaccines influenced by research; University research cited in policy documents. Knowledge Culture: Creation of knowledge centers through investigation. Network: Researchers called to give seminars about their investigation.	Increased researchers' and university reputation; Increased student knowledge – Academic Impact Changes in attitudes and behaviors towards cultural heritage – Cultural Impact Economic growth and employment generation – Economic Impact Increased environmental consciousness – Environmental Impact Increase in life expectancy and quality of life – Impact on Health More sustainable business and government practices; More evidence-based policymaking – Political/Legal Impact Research changes how companies, or the public understand social problems and how to solve them – Social Impact More innovation and research-based technology – Technological Impact

Table 2: Education Indicators

Inputs	Activities	Outputs	Outcomes	Impact
Professors and Students	Education	<p>Student satisfaction with lectures;</p> <p>% of students that graduate within the expected time of the course;</p> <p>% of retention of students from the first to the second year;</p> <p>N° of internship opportunities given to graduates;</p> <p>Graduates employment rates;</p> <p>N° of subjects that implement the SDG;</p> <p>N° of debates about politics and governance attended by students;</p> <p>N° of scholarships given to students;</p> <p>% of turnover spent on funds for scholarships;</p> <p>N° of online learning subjects/courses;</p> <p>N° of hackathons organized by the university.</p>	<p>Capacity Building: Average class grade.</p> <p>Conceptual: N° of students that participate in politics.</p> <p>Instrumental: N° of students employed a year post-graduation;</p> <p>National or international prizes for the quality of education; N° of created startups by students; N° of programs that form PHD students; N° of PhD students supervised; Resources saved with online classes.</p> <p>Knowledge culture: % of students pursuing further study within 12 months of graduation.</p>	<p>Students gain more skills, knowledge, and critical thinking abilities from their study at the university – Academic Impact</p> <p>Stronger appreciation for arts and heritage – Cultural Impact</p> <p>Graduates contribute to industry growth – Economic Impact</p> <p>More practices towards sustainability and environmental responsibility – Environmental Impact</p> <p>Stronger mental health support systems – Impact on Health</p> <p>More politically engaged citizens – Political/Legal Impact</p> <p>Increased social responsibility in students – Social Impact</p> <p>Students engage in technology development – Technological Impact</p>

Table 3: Outreach Indicators

Inputs	Activities	Outputs	Outcomes	Impact
Stakeholders, staff and students	Outreach	<p>N° of guest lectures given by companies at the university;</p> <p>N° of international faculty members;</p> <p>% of students on an international exchange program lasting three months or longer;</p> <p>N° of events for international students (freshman day, buddy program);</p> <p>N° of faculty staff called to give seminars outside the university;</p> <p>N° of contributions to journalism, documentaries, public discourse, consultations, and policy frameworks;</p> <p>N° of collaborations with industries;</p> <p>N° of entrepreneurship programs run by the university;</p> <p>Faculty participation in government committees;</p> <p>N° of students doing voluntary work promoted by the university;</p> <p>N° of community projects led by the university.</p>	<p>Instrumental: N° of keynote addresses; University carbon footprint, green campuses, and sustainability policies in the community.</p> <p>Conceptual: New knowledge acquired from students due to guest lectures given by companies.</p> <p>Knowledge Culture: Policy influence through their environmental awareness practices.</p> <p>Network: N° of relationships created with international/Erasmus students; Formed connections with people outside the university through seminars; More student engagement with companies.</p>	<p>Stronger relationships created between the university and external partners – Academic and Social Impact</p> <p>More inclusive and culturally vibrant society – Cultural Impact</p> <p>Growth in the regional economy, labor market, innovation, and business opportunities – Economic Impact</p> <p>Better environmental conditions; Reduction of CO₂ emissions, and use of raw materials – Environmental Impact</p> <p>Increased access to healthcare services – Impact on Health</p> <p>More community engagement in governance – Political/Legal Impact</p> <p>Widespread adoption of new technologies – Technological Impact</p>

5 Empirical Setting and Some Results

Based on our framework we decided to measure CPBS impact on society (Table 4) with real data for some types of impact – academic, economic, political, social, and technological.

Table 4: CPBS Impact Framework

Activities	Outputs	Outcomes	Impact
Research	<p>N° of peer-reviewed articles;</p> <p>Revenue/Funding from research and projects;</p> <p>N° of research papers that address the SDGs;</p> <p>N° of research papers that have a classification on ABS;</p> <p>Creation of investigation centers.</p>	<p>Instrumental: N° of citations in policy documents; National or international prizes for the quality of articles; N° of joint degree programs and/or research collaborations producing publications in Scopus; N° of citations on Scopus per article; N° of academic citations in public policy documents and in professional articles.</p> <p>Conceptual: Increased researchers’ reputation; N° of researchers’ books used by students (increased student knowledge from researchers’ books).</p> <p>Network: N° of research collaboration with international institutions; Positions on scientific committees of national or international research evaluation bodies; Participation as editor of prestigious peer-reviewed international journals; Participation as a guest speaker at research seminars, prestigious schools, or national scientific conferences.</p>	<p>Increased University reputation from their research projects – Academic Impact</p> <p>Change in economic growth and wealth of the region produced by CPBS research – Economic Impact</p> <p>More sustainable business and government practices and evidence-based policymaking; – Policy/Legal Impact</p> <p>People are more aware of social issues due to research – Social Impact</p> <p>More innovation and research-based technology – Technological Impact</p>

Activities	Outputs	Outcomes	Impact
Education	<p>N° of subjects that implement the SDG;</p> <p>N° of online learning subjects/-courses;</p> <p>Student satisfaction with lectures;</p> <p>% of students that graduate within the time expected of the course;</p> <p>% of retention of students from the first to the second year;</p> <p>% of students that receive scholarships;</p> <p>% of turnover investment to recruit or support low-income students;</p> <p>N° of internships opportunities given to students;</p> <p>N° of faculty members that are members of a committee;</p> <p>N° of executive education programs;</p> <p>Number of clubs organized by students in the university.</p>	<p>Instrumental: N° of students employed a year post-graduation; National or international prizes for the quality of education; N° of created startups by students; N° of programs that form PHD students; N° of PhD students supervised.</p> <p>Capacity building: Average final grade of students in comparison with the entry grade; Students with more skills and critical thinking abilities from their study at the university that help solve societal issues.</p> <p>Conceptual: Increased student participation in politics; Students get more aware of social issues (poverty, discrimination).</p> <p>Knowledge Culture: % of students pursuing further study within 12 months of graduation.</p>	<p>Improved education system – Academic Impact</p> <p>Increased economic growth of the country due to more qualified students in national companies – Economic Impact.</p> <p>Students with more political views and knowledge – Policy/Legal Impact</p> <p>Shifts on how students and faculty think about societal issues – Social Impact</p> <p>Increased tech innovation – Technological Impact</p>

Activities	Outputs	Outcomes	Impact
Outreach	N° of guest lectures given by companies at the university; N° of international faculty members; % of students on an international exchange program lasting at least three months; N° of events for international students (freshman day, buddy program); N° of faculty staff called to give seminars outside the university; N° of events organized by the university; Contributions to debates, consultations, and policy frameworks; Positions on the Board of Directors of international scientific associations; N° of community projects led by the university; N° of students doing voluntary work promoted by the university.	Instrumental: N° of keynote addresses; Influence on the definition of national and/or international public policies. Conceptual: New knowledge acquired from students due to guest lecturers given by companies. Network: Formed relationships with people outside the university through seminars and webinars; Strengthened relationships between universities and external partners.	Increased university's reputation and opportunities – Academic Impact More funding received due to attended conferences, and committees participation – Economic Impact . More politically engaged citizens, and participation in democratic processes – Policy/Legal Impact

5.1 Data Visualization and Analysis: Exemplary dashboards

The KPIs in table 4 need to be organized in a setting that allows a proper visualization of the outputs, outcomes and impact. With the data provided by CPBS we were essentially able to measure outputs and some outcomes of each activity as the data on impact was hard to collect. However, we made a proposal on how we can visualize those outputs and outcomes through the creation of three dashboards, one for each activity.

Starting with the research dashboard in figure 4, we can see the quantity of joint productions CPBS had with other institutions, the number of papers published that are peer-reviewed academic research articles and articles in general public media magazines, the total research funds until 2024, the evolution of the number of Scopus Citations since 2005, the score of SDGs present in the published articles from 1 (not done any research on this SDG) to 10 (most of my research is in this SDG), the key-words present in all articles, the evolution of the indexed papers and its quality, and the number of papers with ABS ranking above 3 from all the articles (being indexed or not).

What we can take from the analysis of this dashboard is the clear evolution in the number of citations in Scopus (currently there is a total of 14 thousand Scopus citations) and the quality of the papers which has a positive growth since 2005. Also, the Sustainable Development Goals

course with the best average final grade is the double degree.

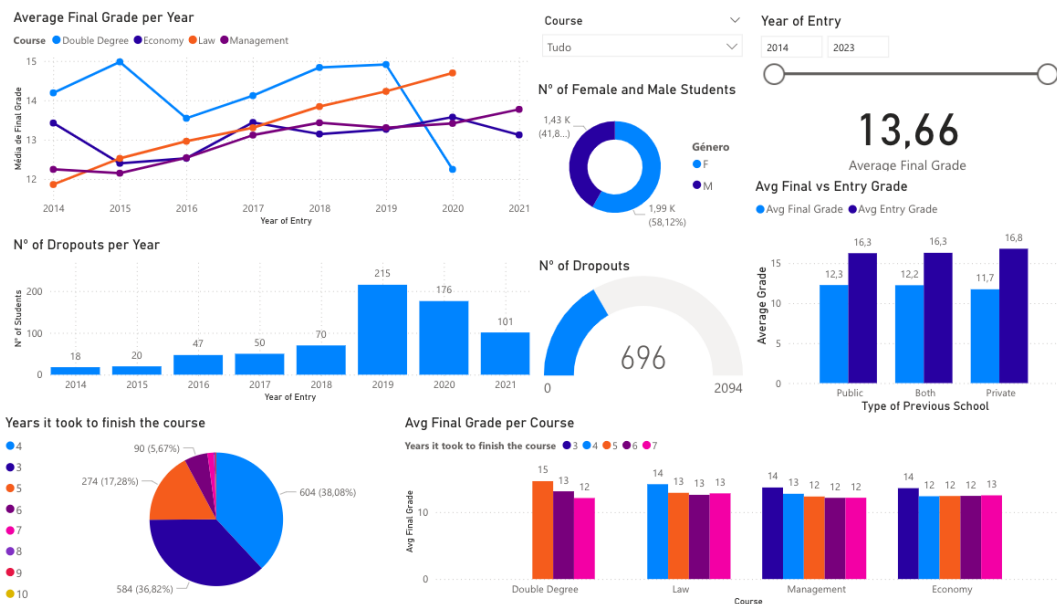


Figure 5: Education Data Dashboard

Finally, in the outreach dashboard in figure 6 we added information regarding the events attended by the university per country, the number of outreach activities per country, and the number of outreach activities done by the university.

With these graphics, we can see that the outreach activities that are done the most at CPBS are conference contributions, organizing conferences and workshops, invited talks, and consultancies. We can also observe that the university has a vast portfolio of countries it went to for events including Spain, France, Brazil, Australia, United States of America, among others. It is important to mention that the events attended per country are only conference contributions, keynotes, scientific committees, invited talks, and being a speaker. Finally, the countries where CPBS attends the most events are Portugal, United Kingdom, and Italy.

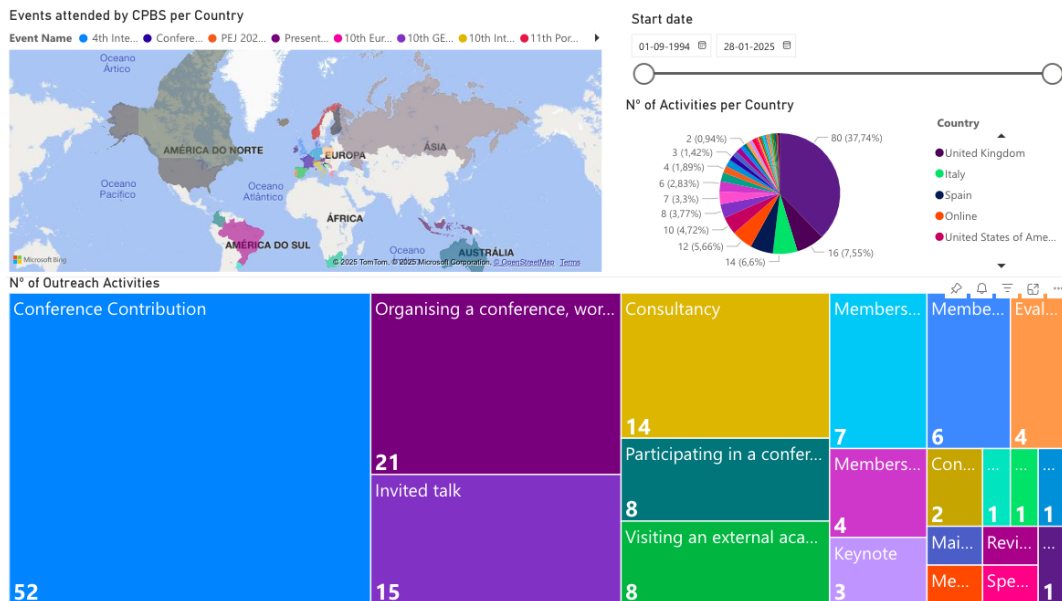


Figure 6: Outreach Data Dashboard

5.2 Qualitative Insights: Impact Narratives at CPBS

5.2.1 Research

Católica Porto Business School (2025a) has investigation centres in management and economics (CEGE), management and applied economy (CEGEA), and knowledge transfer centers. The school's research framework is structured around two complementary dimensions: fundamental research, conducted through CEGE, and consulting, carried out by CEGEA. CEGE focuses on advancing fundamental research in the areas of economics and management. Its core mission is to contribute to academic progress in these disciplines, promote a strong research culture, produce work with societal and policy relevance, and ensure broad dissemination of findings within both the scientific community and society in general. Research at CPBS is deeply aligned with the institution's strategic goals and its active relationships with the business community. It is typically carried out in partnership with international academic networks and targets globally well-recognized publications. In parallel, CEGE collaborates with four knowledge transfer centers that emphasize practice-based research. These centres work closely with businesses and non-profit organizations to co-develop applied research projects and act as platforms for integrating academic research with real-world needs.

5.2.2 Education

The university is well-recognized for its excellent education making its students high-qualified academics. CPBS is accredited by Equis Accredited, Association of Ambas, AACSB

Accredited, and A3ES, and it is ranked by European Business Schools 2024 Ranking, QS World University Ranking Executive MBA and Business Master's 2023.

Very recently, three master's degree students from CPBS occupied the podium places in the Economy Award of Porto for their academic dissertations which touched on relevant topics for the city's economy (Universidade Católica Portuguesa (2024)). This is a great example of how CPBS is a well-recognized and prestigious school.

The School also gives a lot of internships opportunities to their students in reputable companies, which gives them an advantage when stepping into the labor market.

CPBS even offers its students the chance to get a merit scholarship that can cover from 20% to 100% of the total value of the tuition fees. Furthermore, CPBS has several welfare solutions for its students with disabilities providing a scholarship that covers 60% of the tuition fees provided by Directorate General of Higher Education (DGES).

5.2.3 Outreach

CPBS has a lot of partnerships with the Association of Africa Business Schools, the Business Graduates Association, the CFA Institute, and PRIME.

Moreover, the School organizes a vast quantity of international programs (Católica Porto Business School (2025b)) such as the Globally Responsible Leadership for Sustainable Transformation program which exists to catalyze the development of globally responsible leadership and practice in organizations and societies around the world. This program is taught by professors from seven GRLI universities in Asia, Europe, and North America.

CPBS also organizes the Atlantic program offered by the Catholic Business Universities of Angola, Brazil, and Portugal with face-to-face and online sessions, including three periods of immersion in the respective countries, during which participants come into contact with the local economic, social, and cultural realities.

5.2.4 Impact Narratives

To conclude, we will now present some impact narratives related to research activities written by CPBS researchers and connect them with different types of impact:

“I do research focused on happiness in secondary schools, where we identify the key factors influencing the well-being of teachers and students in Portuguese schools. Additionally, through another research stream on efficiency and productivity analysis, my work has helped enhance public practices, ultimately contributing to improved well-being and economic growth.”

– **Academic and Economic Impact**

“I do research with a focus on behavioral finance that can help policy-makers to develop better policies to reduce the level of market inefficiency caused by irrational investor decision-making and can promote a more ethical, responsible and sustainable approach to financial markets.”

– **Political/Legal Impact**

“I examine how a mental health hospital balances care and costs to achieve financial sustainability while maintaining good-quality patient services. Additionally, I analyze how international organizations integrate Generative AI (GenAI) for sustainable development, exploring its impact on resource efficiency, strategic decision-making, and alignment with sustainable development goals (SDGs). These projects emphasize responsible innovation, ensuring that financial and technological advancements support ethical, sustainable, and socially responsible practices.”

– **Social and Technological Impact**

6 Discussion

Despite the efforts to ensure the robustness of the framework and the dashboards, there are limitations to this study. The quality of the data provided by the university may have influenced the accuracy of the analysis due to missing or incomplete data.

The research data information was divided into different databases. To solve this, we had to create some primary and secondary keys for each table to create relationships between the different databases. For this analysis, we had to be very meticulous since an article could have been written by more than one author and one author could have written more than one article. This was important to consider in creating the graphics since duplicated values would bias our analysis. The education data had some missing values and errors which needed to be fixed for the creation of the dashboards in Power BI. Also, it missed some important fields such as the exact date that students entered the course, the SDGs present in the subjects of each course, the student satisfaction with the lectures, and similar sample sizes of the number of students for each course per year. Finally, the outreach data only had information about the attended and organized events by CPBS per country and the type of outreach activities done by the university. What can be found on this topic is mainly on the CPBS website which has a lot of information on international projects organized by the university.

What we can conclude from the quantitative and qualitative data is that CPBS seems to be on the right path toward the creation of impact. With their research quality, research centres, and qualified researchers in different sectors, CPBS creates a vast number of papers from which a great part of them are indexed with an ABS classification. Also, their education is well-recognized nationally and internationally with a lot of students being awarded for their great performances. Finally, their outreach activities have a great focus on international programs that allow students to get in touch with the outside world preparing them for the labor market.

While the created framework was designed to be scalable, its effectiveness may vary if applied to other institutions with different data structures and objectives. Measuring impact may vary between institutions and it is always dependent on the outputs and outcomes of each activity. Since impact is not very easy to measure we need to find the best outputs and outcomes that would eventually lead to it.

7 Conclusion

To conclude, we will finish with our initial research question: “Why and how should HEIs define, generate, and measure their impact on society?”. HEIs should be aware of how to answer this question since every day they are preparing highly qualified individuals who have the power to shape the future of our society. It is also important to be aware of how this impact can be measured to improve the steps towards it.

Our created framework suggests ways of measuring HEIs impact on society in general with the layout of strategic and physical fluxes that try to identify the key indicators for universities’ main activities that lead to outputs, and outcomes, and ultimately generate impact.

The framework tailored to CPBS made us conclude that the school is on the right path to achieve impact with its accredited research, high-quality education, and international programs that contribute to the growth of the university. CPBS just needs to focus more on measuring the steps towards the impact they desire to achieve, with a clear path being designed for it. The results also suggest that CPBS needs to document further information on each activity to facilitate the process of measuring the necessary outputs and outcomes.

This study was limited by the insufficient data and the difficulty in measuring impact since we found more data on outputs and outcomes of research, education, and outreach activities rather than quantifiable impact by itself. Nevertheless, we found some relevant information with evidence on impact on their website and with some impact narratives written by CPBS researchers.

Future research could explore more practical examples of the real implementation of an impact framework in a university and the subsequent results from that. A future research question could be: “Does the implementation of an impact framework influence the impact produced by HEIs?”.

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