POLITECNICO DI TORINO

Department of Regional and Urban Studies and Planning

Master's Degree in Territorial, Urban, Environmental and Landscape Planning

Curriculum: Planning for the Global Urban Agenda

Master Thesis

Sustainability challenges and territorial impact: the role of Higher Education Institutions

Supervisor

Prof. Giulia SONETTI

Candidate

Donatella VALENTE

September 2021

Abstract

Complex sustainability problems require an immediate action. Therefore, the involvement of multiple agents to face a concrete shift in the global system is necessary. Higher Education Institutions (HEIs) have the role of educating the future generations and, at the same time, acting as a positive influence for the local communities in which they are located. Consequently, the so-called "third mission" of a University aims at guiding the Institution's role within a specific territory and society. In fact, one of the main goals is to generate knowledge and human capital outside of the academic environment to achieve a deeper social, cultural, and economic development. Through an active and prolific cooperation between students, teachers, and researchers with the stakeholders in the territory, a more focused educational action could be pursued.

This dissertation aims at analysing the role of HEIs in specific local communities by presenting remarkable practices put in place by prestigious Universities from around the world. Therefore, it will be discussed how teaching methods are addressing sustainability issues. A desired result of this thesis would be to inspire the involvement of other Universities in sustainable practices.

In the first section of this dissertation, the literature that has formed the background of the research will be analysed. Carrying out a selection of relevant scientific publications and academic books, the social role of Universities will be discussed. In the second section, The Times Higher Education World University Rankings 2020 (THE), will serve as a starting point to compare and illustrate the best initiatives and practices that Universities are carrying out.

Keywords: Sustainable development, Higher Education Institutions, transdisciplinarity, third mission, social impact

Sommario

Problemi di sostenibilità complessi richiedono un'azione immediata e il coinvolgimento di quanti più attori possibili per affrontare un cambiamento concreto nel sistema globale. Le università hanno il ruolo di educare le generazioni future e, allo stesso tempo, di agire come influenza positiva sulle comunità circostanti e sui bisogni della società. Di conseguenza la cosiddetta "terza missione" dell'università, mira a guidare le istituzioni ad occuparsi del territorio e della società e di generare conoscenza al di fuori degli ambienti accademici per raggiungere un più alto sviluppo sociale, culturale ed economico. Attraverso una collaborazione attiva e prolifica tra studenti, docenti e ricercatori con gli stakeholders del territorio, si potrebbe perseguire un'azione educativa più mirata.

Lo scopo di questa tesi è analizzare il ruolo delle univeristà in specifiche comunità locali presentando pratiche notevoli messe in atto da prestigiose università di tutto il mondo. Pertanto, verrà discusso come i metodi di insegnamento stanno affrontando i problemi di sostenibilità. Uno dei risultati desiderati di questa tesi, è quello di ispirare il coinvolgimento di altre università nelle pratiche sostenibili.

Nella prima sezione di questa tesi verrà analizzata la letteratura che ha costituito la base della ricerca. Effettuando una selezione di pubblicazioni scientifiche e libri accademici di rilievo, verrà discusso il ruolo sociale delle università. Nella seconda sezione, The Times Higher Education World University Rankings 2020 (THE), servirà come punto di partenza per confrontare e illustrare le migliori iniziative e pratiche che le università stanno portando avanti.

Parole chiave: sviluppo sostenibile, università, transdisciplinarità, terza missione, impatto sociale

Table of Contents

List of Tables

List of Figures

Acronyms

HEI

   Higher education institution

SDG

   Sustainable Development Goal

THE

   Times Higher Education

UNECE

   United Nations Economic Commission for Europe

UN

   United Nations

COP21

   United Nations Climate Change Conference

TDR

   Transdisciplinary research

IPCC

   Intergovernmental Panel on Climate Change

HESI

Higher Education Sustainability Initiative

PRME

Principles for Responsible Management Education

SDSN

Sustainable Development Solutions Network

ANVUR

Agenzia nazionale di valutazione del sistema universitario e della ricerca

VQR

Valutazione della qualità della ricerca

RUS

Network of Universities for Sustainable Development

CRUI

Conference of Rectors of Italian Universities

ASviS

Italian Alliance for Sustainable Development

CETM

Commission of Experts for the evaluation of the Third Mission

CBL

Challenge-Based Learning

USYD

University of Sydney

WSU

Western Sydney University

ASU

Arizona State University

UNIBO

University of Bologna

UBC

University of British Columbia

KCL

King's College London

NGOs

Non-governmental organizations

GOs

Governmental organizations

IGOs

Intergovernmental organizations

NPOs

Non-profit organizations

OECD

Organization for Economic Co-operation and Development

Chapter 1

Introduction

The thesis aims at finding and analyzing the different actions that universities are adopting to face global sustainability challenges and to present some of the best practices that can be replicated in other parts of the world. To achieve the research's objective, at the first stage an investigation "name of the university + keywords" on Google Search engine was conducted, taking into consideration the top ten universities from The Times Higher Education Impact Rankings 2020 (THE), which is the only global performance tables that assess universities against the United Nations' Sustainable Development Goals (SDGs). In a second phase, the initiatives found for each university are analyzed and compared.

The structure of the introduction is as follows: in the first place, an overview of the current sustainability challenges and the 2030 Agenda is given, secondly, the role of the university in the society and its missions are presented with a focus on the Italian situation, followed by the presentation of the importance of the university in the era of the SDGs.

1.1 Background

The 2030 Agenda for Sustainable Development, signed on 25 September 2015 by the governments of the 193 member countries of the United Nations, represents the new global reference framework for national and international commitment aimed at finding common solutions to the great challenges of the planet [1]. The

broadness and deepness of the SDGs require not only an interaction between the different Sustainable Development Goals but also a concrete effort in the interplay between all sectors and actors [2].

Universities, considered as neutral but influential players, have an important position at implementing sectoral interlinkages and having a strong impact on change, providing research experts, active education for future generations, and involvement with societal challenges. "Faculty, students, and staff need to engage in real problem-understanding and problem-solving and ensure that their universities become a pivotal force to guide wider community efforts to advance societal sustainability." [3].

1.1.1 Sustainable development through the 2030 Agenda

The importance of sustainable development models led the international debate to adopt an international strategy that takes these characteristics into account. In the international context it is possible to include some important events in which the problem of coordinating all States towards more virtuous attitudes was discussed. The UN Conference Sustainable Development in Johannesburg, 2002, where the primary objective was to produce a broad agenda and a new blueprint for international action on environmental and development issues that would help guide international cooperation and development policy in the twenty-first century. Ten years later, the UN Conference Rio + 20 in Rio de Janeiro, 2012, initiated the definition of the Sustainable Development Goals and has drawn up within the "Future we want", a list of actions necessary for sustainable global development, but without proposing concrete solutions to implement them.

A decisive year for the realization of an international approach to sustainable development, was 2015 when on 25 September the world leaders adopted during the 70th UN General Assembly, a political program and a common global strategy for effectively promote the sustainability of development models: "Transforming our world: the 2030 Agenda for Sustainable Development" [1]. In the same year, there was also the Paris Climate Agreement (COP21) which is the first universal and legally binding agreement on climate change, adopted at the Paris climate conference, which pursues the goal of limiting average global warming to below
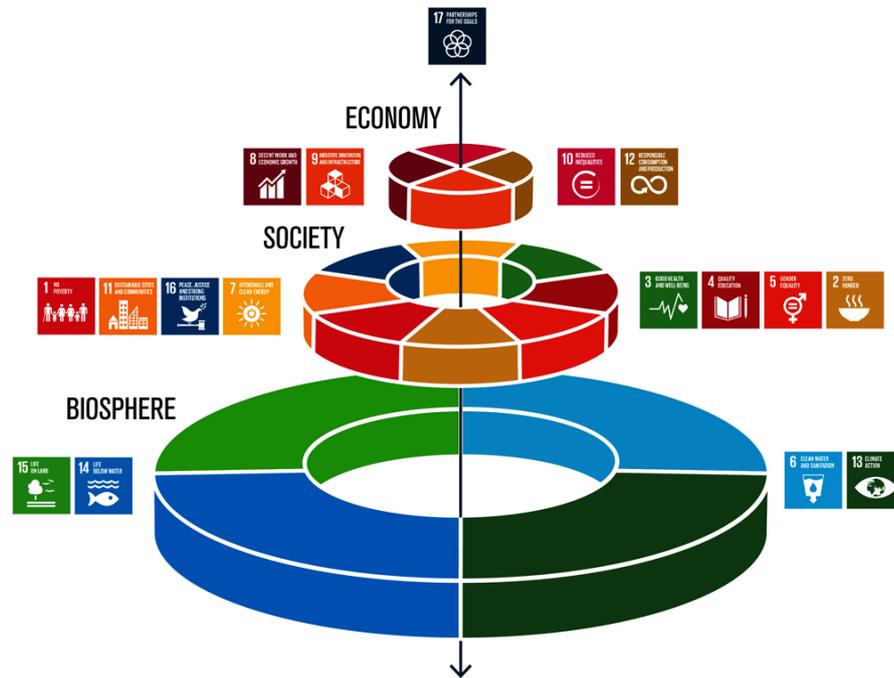
Figure 1.1: 17 SDGs structure.

2 degrees Celsius compared to the pre-industrial period, aiming for a maximum temperature increase of 1.5 degrees Celsius. In addition, 2015 was also promising for the adoption of the Sendai Framework for Disaster Risk Reduction that sets out the overall objective to substantially reduce disaster risk and losses in lives, livelihoods, and health and in the economic, physical, social, cultural, and environmental assets of persons, businesses, communities, and countries [4].

All governments, administrations, citizens, and all countries, developed or developing, have been invested with the shared responsibility of reaching the targets set by the SDGs. The 2030 Agenda represents the new global reference framework for the national and international commitment aimed at finding common solutions to the great challenges of the planet, such as extreme poverty, climate change, environmental degradation, and health crises by 2030 (United Nations, 2015). It consists of 4 parts: Statement, Objectives and targets, Implementation tools, Monitoring. Structure in which the 17 sustainability objectives (SDGs) supporting the strategy, the 169 targets and 240 indicators are inserted.

For the first time, a clear judgment is expressed on the unsustainability of the

Figure 1.2: List of the 2030 Agenda 17 SDGs.

current development model, not only on the environmental level but also on the economic and social one, definitively overcoming the idea that sustainability is only an environmental issue and affirming an integrated vision of the different dimensions of development. In fact, the 2030 Agenda is based on the 5 "P" of sustainable development: People, Planet, Prosperity, Peace, and Partnership. They help guide the relationship between Member State policies, both within societies and with the rest of the world. In the long term, some objectives bind the implementation of the others, for this reason, the 17 SDGs are represented according to the image of the so-called "wedding cake" (Figure 1.1), with the goals linked to maintaining the vitality and resilience of the biosphere at the base.

The 17 Sustainable Development Goals SDGs (Figure 1.2) and the 169 sub-goals associated with them constitute the vital core of the 2030 Agenda. They consider in a balanced way the three dimensions of sustainable development, namely economic, social and ecological. For the first time, a single policy document brings together sustainable development and the fight against poverty. The implementation status of the 2030 Agenda can be consulted through the Sustainable Development Report Dashboards which shows the progress of the implementation of the 17 SDGs for each nation in the world in a range between 0 and 100 percent. Europe, North America, and Oceania are the continents where the impact of the SDGs is greater,

averaging over 70 points. However, only some European countries show a score higher than 80, giving a sign of the importance and commitment that is being made to reach the objectives of the 2030 Agenda.

The 2030 Agenda for Sustainable Development is very interested in educational topics and in fact, (SDG 4) is the education goal that aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." Target 4.7 of this SDG is specifically related to education for sustainable development: "By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and culture's contribution to sustainable development." [5]

1.1.2 Current challenges and transdisciplinarity approach (TDR)

Awareness of the precarious conditions of the environment and how climate change and its related risks are permanently damaging the world, is increasingly becoming a current and global issue, as well as the transformation and adaptation of models of development and their economies. Among the most recent reports, The Global Risks Report 2020 [6], published by the World Economic Forum, provides a rich perspective on the major threats that may impact global prosperity in 2020 and over the next decade (Figure 1.3). The paper draws on feedback from nearly 800 global experts and decision-makers, invited to rank their concerns in terms of probability and impact and for the first time in the survey's 10-year outlook, the top five global risks in terms of probability are all environmental. For this purpose, the report stresses the need for a multistakeholder approach and a collective action to addressing the world's greatest challenges.

Moreover, the Intergovernmental Panel on Climate Change (IPCC), published in 2018, provides a special report on global warming of 1.5°C [7], that based on a study of over two years, it shows that if the trend measured starting from the pre-industrial age is maintained, global warming will increase by about 1.5°C
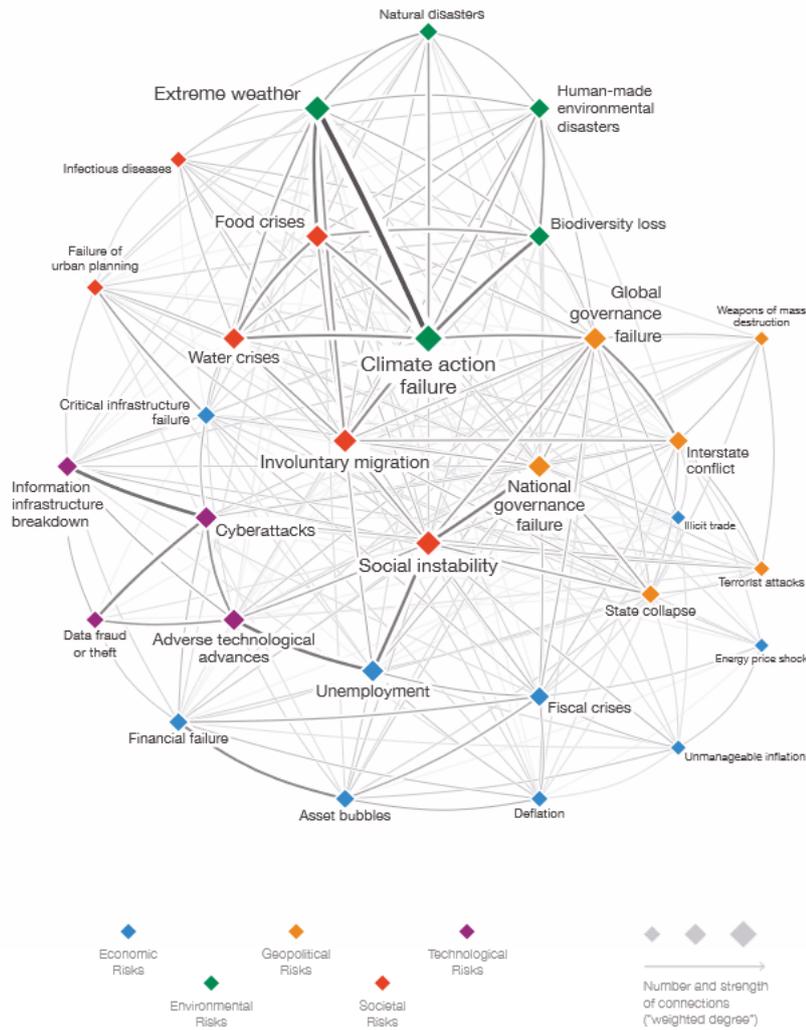
Figure 1.3: The Global Risks Interconnections Map 2020.

between 2030 and 2052. Furthermore, if action is not taken promptly, the increase could reach 2°C in less than 12 years. If this happens, the "tipping points" that IPCC AR5 defines as irreversible changes in the climate system will be exceeded.

Therefore, it is in this context that the need to adopt an integrated approach to address complex economic, social, environmental, and institutional issues is rooted and consolidated to make the transition towards a truly sustainable development model.
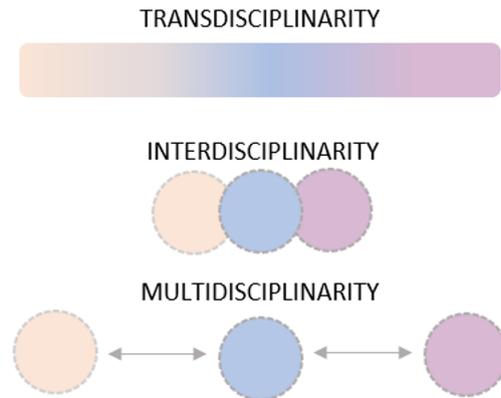
Figure 1.4: Difference among transdisciplinarity, interdisciplinarity and multidisciplinarity.

How manage these complex sustainability challenges in a collabora-tive approach to connect research to action and citizens knowledge and participation?

Sustainability problems, for which there is not a single and clear solution, are increasing in intensity and number and they appear difficult to be treated. These problems, in fact, vary from the technical problems that can be controlled using standard methodologies and they are "complex" because they involve the perspectives of many people and multiple aspects of a societal problem. An approach that combines the scientists, decision-makers, and people and that tries to help society cope with societal challenges, is called transdisciplinary research (TDR). As it was developed in several fields, there are many different definitions of TDR and one that is popular in the field of sustainable development and could be taken into consideration is:

"Transdisciplinarity is a reflexive research approach that addresses societal problems by means of interdisciplinary collaboration as well as the collaboration between researchers and extra-scientific actors; its aim is to enable mutual learning processes between science and society; integration is the main cognitive challenge of the research process." [8]

Transdisciplinarity has evolved from the earlier research fields of multidisciplinar-ity and interdisciplinarity, which definitions can be confusing due to their apparent

similarity. Multidisciplinarity is defined as research that studies an argument not only in one discipline but in several disciplines at the same time. This approach overcomes the boundaries between the different disciplinary fields, but its goals remain in the disciplinary research framework. Similarly, interdisciplinarity means collaboration between members of different disciplines working on the same project and transferring methods and knowledge from one discipline to another [9]. What differentiates transdisciplinarity from multidisciplinarity and interdisciplinarity (Figure 1.4) is the fact that the first is more interested in the academic and practical implications of the knowledge generated in order to promote a mutual learning process between academics and practitioners, working across and beyond disciplines, eliminating boundaries [10]. "Practitioners are considered experts for coping with (contextualized) real-world challenges; scientists are considered experts for validated, method-, theory-, and (partly) evidence-based descriptions of (general) dynamics underlying real-world systems." [11]. In fact, it is not possible to teach or research sustainable development without the collaboration between society and academia in order to cope with the complex challenges of society [12].

Transdisciplinarity, and a change in the education system that goes beyond the boundaries of a disciplinary perspective, is a necessary priority for the realization of global sustainability which includes the participation of society and universities as key actors. The structure of the university should reflect the structure of the society and transdisciplinarity could help to overcome the gap between institution, community, and private sector establishing an active relationship with other forms of knowledge.

1.1.3 The role of the university in society: the rise of the third mission

The answer to what the role of the university is in current society has been debated for many years and never as today is a question to be addressed in order to actively contribute to current challenges. The most traditional answer to this question is that the role of these institutions is:

- Teaching and learning: the first mission of the University, dating back to the later Middle Ages Universities of Bologna and Paris, is the transmission of

knowledge through the generations, due to highly qualified figures.

- Research: the second mission of the University emerged in the preindustrial German states (the 1800s) at the University of Berlin and refers to increase knowledge and respond to social welfare needs.

In the past, the university was considered as an "ivory tower" isolated from the rest and with the only aim of research and teaching [13]. The term "third mission" emerged in the late 20th century with the meaning to have an active role of universities leading to social and economic development after the crisis of World War II [14]. In those years, there was also the emergence to have research more focused on the real-world problems and according to the "Triple-Helix" model, theorized by Henry Etzkowitz and Loet Leydesdorff in the 1990s, which refers to a set of interactions between the university, industry, and government, to foster economic and social development, the academia is a crucial actor in regional development. Although the third mission of higher education was born with a special focus on economic development [15], nowadays its most emerging activities are technology transfer, lifelong learning, and community engagement [16].

According to [17] the national institutional framework has relevant importance for the evolution of the university. Even if the third mission is a phenomenon that is happening globally and since there are no universal definitions of its activities, it can vary from one university to another. One of the most difficult challenges is the definition of "community engagement" and referring to [15]:

> "Community engagement is a process whereby universities engage with external organizations to undertake joint activities that can be mutually beneficial, even if each side benefits in a different way."

Reducing the third mission to the simple role of consulting and solving problems of ordinary administration would dangerously misrepresent this function. In fact, on the above short definition, there is the important concept of the mutual benefit, meaning that there is not a unidirectional process, but universities at the same time are part of the community to face specific challenges and needs while enriching their knowledge process. What is really needed to lay the foundations for a

Universities	Governments and Communities	Students
• Possibilities to market university activities • Strengthened role in socioeconomic development and innovation • Educational services, by government or community officials, to universities in the form of sites for field experience or adjunct faculty in academic programs • Opportunities to work on translational research • Access to data and specialized facilities • Access to legislations and policies in development, and ability to inform their development and implementation • Placement opportunities for faculty members in government offices • Opportunities for new funding streams	• Access to analytical skills, research services, topical area expertise and capacity building initiatives • Evidence-informed policymaking and practice and improved service delivery • Placement opportunities for government or community officials in the form of adjunct faculty in academic programs or policy fellowhip programs • New perspectives and fresh insights into policy areas and priorities, and how evidence and data can inform them • Space to think in an intellectually challenging environment, enabling creative, unconventional problem-solving for policy issues not indoctrinated in usual government practices	• Opportunities to work on translational research • Career opportunities • Hands-on education • Networking with government and other researchers engaged in policy

Figure 1.5: Benefits of university partnerships with governments and communities. Source: [18]

strategy aimed at sustainable development is the partnership between universities and governments and the community to address common actual challenges while transforming societies and getting benefits. Mapping the kind of activities having an impact on society and on the current sustainability challenges among worldwide universities could help implement the understanding of the third mission objectives and results.

1.1.4 Universities in the era of SDGs

The implementation of the SDGs requires the involvement of different stakeholders and universities have the unique position of leading the cross-sectorial implementation of the SDGs, meeting the goals of the 2030 Agenda. Higher education institutions (HEIs), in addition to the role of teaching the future decision-makers,

pursue research and outreach, are large portions of territory in the city in which the principles of sustainability must be applied in all its aspects [19]. Recently, the first steps are being taken in integrating sustainable development into current curricula, research, and the way of operating within the university institution. The strategy to be adopted to achieve these changes is not entirely clear [20] and the literature regarding the way in which universities are carrying out the implementation of the SDGs is not yet plenty [21].

Worldwide, some universities have started to show their interest in the SDGs by supporting initiatives such as Higher Education Sustainability Initiative (HESI), which with the participation of over 300 universities from around the world, provides higher education institutions with a unique interface between higher education, science, and policy-making; the UN's Principles for Responsible Management Education (PRME) which is an initiative that combine the UN and business schools around the world to "inspire and champion responsible management education, research, and thought leadership globally" with the application of six guide principles: purpose, values, method, research, partnership, and dialogue; the Sustainable Development Solutions Network (SDSN), which is a global initiative under the collaboration of United Nations to promote integrated approaches to implement the Sustainable Development Goals (SDGs) and the Paris Agreement on Climate Change, through education, research, policy analysis, and global cooperation in national and regional networks.

In the meanwhile, Australia, New Zealand & Pacific Network of the Sustainable Development Solutions Network (SDSN) that brings together SDSN members in the region to develop and promote solutions, policies and public education for sustainable development, in 2017 provided a guide for universities, higher education institution and the academic sector about the relation between SDGs and the role of the university. The guide highlights the process that the university should follow to start and to deepen their engagement with the SDGs:

- **Step 1 - Map what the university is already doing:** "Mapping what your university is already doing to support and contribute to the SDGs across all areas or within specific areas of the university is a great starting point for discovering possibilities for deeper engagement. It is also a powerful tool for

showcasing what is already in place, as well as for identifying synergies across the university."

- **Step 2 - Build capacity and ownership of the SDGs:** "Taking a participatory approach is key to working towards the SDG agenda. This includes collaboration and partnership within and across organisations and communities by bringing all of those involved in the life and work of the university on board to both champion the work already underway and to create substantial ownership of actions taken."

- **Step 3 - Identify priorities, opportunities and gaps:** "It will allow you to build on the commitment to the SDGs established in Step 2 and begin to progress and integrate the SDGs at your university. This Step is central to setting whole-of-university intentions and commitments to the SDGs."

- **Step 4 - Integrate, implement and embed the SDGs:** "The previous Steps set the scene for the university to move forward. This Step looks to identify the best way of integrating and implementing commitment and actions on the SDGs. This will ensure your university moves towards a leadership role and can become a champion for the SDG."

- **Step 5 - Monitor, evaluate and communicate:** "The way in which universities evaluate and celebrate their contributions to the SDGs is key to informing and shaping future engagement and action. Cohesive and well-grounded monitoring, evaluation and communications plan will enable universities to create and share compelling stories to draw both the necessary support for their future engagement with the SDGs and to widen the shared understanding of the SDGs."

Starting from 2019, The Times Higher Education, which is one of the most known ranking institutions in the world, proposed the ranking of universities according to their performance against the United Nations' Sustainable Development Goals (SDGs), taking into consideration indicators related to their core missions: teaching, research, knowledge transfer and international outlook. This could be considered an important step forward because it makes understand the importance that

universities are starting to have in making a positive social and economic impact through their works and action.

1.2 Italian universities against SDGs' implementation

Referring to the Italian context, rather recently, in July 2015, the Network of Universities for Sustainable Development (RUS[1]) was promoted by the Conference of Rectors of Italian Universities (CRUI). RUS is the first experience of coordination and sharing between all Italian universities engaged in the issues of environmental sustainability and social responsibility with the aim of spreading the culture and good practices of sustainability, both inside and outside the universities; promote the SDGs and contribute to their achievement; strengthen the recognition and value of the Italian experience at an international level. At the time of the thesis (May 2021), RUS counts 78 Italian universities with continuous growth and it is divided into seven working groups dedicated to priority issues for the achievement of the institutional objectives of the Network: climate change, education, energy, food, mobility, waste, and inclusion and social justice. A survey is carried out annually with the dual purpose of having an always updated image of an ever-expanding network and mapping the activities and initiatives of universities on the subject of sustainable development. For the 2020 survey, an online questionnaire was administered at 74 universities adhering to the RUS in April 2020 and 59 responses were received, with a response rate of 80%. The questionnaire is structured in 11 sections: the principles of sustainable development, Agenda 2030 and SDGs, delegations, organizational structure, sustainability activities, students, communication channels, reporting, networks and, finally, the specific questions of the working groups.

From the results it emerged that the areas of work in which it is possible to find references to the principles of sustainable development are: in the first place teaching, followed by third mission, then research and finally management

---

[1]`https://reterus.it/`

13

of the campus. The first three SDGs mainly attributable to the activities of the universities in question are: goal 4 (quality education), goal 3 (good health and well-being), and goal 13 (climate action). The barriers and obstacles most encountered in the implementation of actions for sustainable development were: lack of dedicated resources, difficulty in measuring effectiveness and impacts, procedural and bureaucratic barriers. A positive fact is that 56 out of 59 respondents declared the involvement of students in the university's sustainable development activities mainly through dedicated awareness-raising events, then through the activation of specific projects with a defined duration, then through continuous collaboration and finally through specific calls. 27 universities have declared to join the Greenmetric ranking, 13 the THE Impact ranking and 28 to not join any ranking.

The RUS collaborates with other sustainability-related national associations, such as ASviS[2] (Italian Alliance for Sustainable Development), born on February 3, 2016 to raise awareness of the importance of the 2030 Agenda for sustainable development and to mobilize in order to achieve the Sustainable Development Goals. The Alliance currently brings together over 300 of the most important institutions and networks of civil society (associations representing the social partners, networks of civil society associations, associations of local authorities, universities and public and private research centers, associations of subjects active in worlds of culture and information, foundations and networks of foundations, Italian subjects belonging to international associations and networks active on sustainable development issues).The ASviS Annual Report is the main publication of the Alliance for the achievement of the Sustainable Development Goals in Italy. The document, in addition to providing updates on the commitment of the international community for the implementation of the 2030 Agenda for sustainable development of the UN, focuses on the national context, articulated on two levels: an analysis on the progress of our country, and an organic framework of policy recommendations, to be submitted to top management, to indicate the areas in which action must be taken to ensure the economic, social and environmental sustainability of our development model and thus influence the strategies and activities of the Government. According the 2020 ASviS report, for Italy the

---

[2]`https://asvis.it/`

path towards the UN 2030 Agenda in 2020 is recorded with a worsening for 9 of the 17 Sustainable Development Goals. For this reason, there is a need to undertake a change capable of generating new employment and economic and social development, using EU and national resources consistently to relaunch the country with a view to economic, social and environmental sustainability.

1.2.1 The Italian third mission

As explained in the article [22], one of the challenges to be faced to make the Italian university stronger, is undoubtedly opening up to the outside world, to businesses, to the public sector, to private and public research organizations, and to investors. Circumscribing the skills, ideas, and projects developed within the university within the confines of the Campus and not knowing how to enhance and transfer the work of innovation and knowledge production to the outside is a serious lack and a significant loss of opportunity. To achieve the strategic goal of the university's third mission, it is necessary to create an operational infrastructure dedicated to third mission activities. This infrastructure must include the components of the university that are most involved: the administrative offices, technicians, teachers and researchers and those who are the real protagonists and who can and must play an important role, the students. While European universities are already undergoing an advanced institutional and organizational change, Italian universities still have little institutional coordination of processes and resources. In the other countries, in fact, universities offer a service (research and technical consulting) and a private entity finances it or there is direct collaborative involvement in research activities created between academic, institutions and other entities, whether public or private [23].

The third mission has been defined as the "openness of the university towards the socio-economic context through the valorization and transfer of knowledge" by the body of the Italian republic "Agenzia nazionale di valutazione del sistema universitario e della ricerca" (ANVUR). Despite the difficulties involved in the analysis of such a complex phenomenon, due to the fact that the legislative provision is still incomplete, the measurement and evaluation of the third mission have for some years been the subject of increasing attention both at the local and at the

national level. In fact, in 2013, for the first time, Italian universities were involved by Anvur in a first national collection of data about the third mission (VQR 2004-2010). The results represented the first measurement of third mission activities in Italy which already highlighted the limits of still unstable metrics and reliability of data sources. Overall 82 Italian universities, out of the 95 evaluated, have raised over 3 billion euros for "third party" contracts, or research or consultancy contracts with external clients. An increasing value over time that would denote greater attention to this activity, but also the growing need to collect additional resources for funding for national research projects certainly not comparable to those of other European Union countries [24]. The starting point for the institutional accreditation of the third mission is the legislative decree no. 19 of 27 January 2012 and the subsequent ministerial decree, Ministry of Education, University and Research, no. 47 of 30 January 2013 which recognized the third mission as an institutional mission of the University alongside the traditional research and teaching missions. During the second evaluation exercise, the third mission has been inserted in the VQR 2011-2014, with the aim of promoting greater awareness of this type of initiative among the institutions. The assessment of the third mission was entrusted to a commission of experts using the informed peer review approach. From the results of the data analyzed, a non-homogeneous picture emerged in relation to the third mission activities carried out by the Italian universities, due to a possible lack of awareness of the third mission activities, rather than as a lack of initiatives. Although lagging behind other European countries, there is a significant degree of organizational maturation achieved by technology transfer activities in Italian universities thanks to the creation of offices specifically dedicated to this. In January 2020, the third 2015-2019 VQR exercise was launched and in July 2020 the commission that will evaluate the case studies concerning the third mission activities carried out by the Institutions and Departments was formed, composed not only of highly qualified teachers and proven expertise on the third mission but also of public executives and personalities from the productive and financial world, cultural institutions and territories. The case studies refer to interventions whose impact is verifiable in the following fields of action:

(a) Enhancement of intellectual or industrial property (patents, etc.);

(b) Academic entrepreneurship (spin-off, start-up, etc.);

(c) Intermediation and technology transfer structures (incubators, technology transfer offices, third mission associations, etc.);

(d) Artistic and cultural heritage (museum centers, archaeological excavations, historical libraries, sports facilities, and theaters, etc);

(e) Health protection (screening and awareness campaigns, etc);

(f) Lifelong learning (continuing education courses, MOOCs, etc.);

(g) Public engagement (organization of cultural activities of public utility, scientific publication, initiatives to involve citizens in research, activities of involvement and interaction with the school world);

(h) Public goods and policies for inclusion (programs of public interest, participation in urban development projects, etc.);

(i) Open science and activities related to the Sustainable Development Goals (SDGs).

Each case study will be evaluated by the interdisciplinary commission according to the following criteria: social, economic and cultural dimension of the impact; relevance with respect to the reference context; added value for the beneficiaries; contribution of the proposing structure, enhancing the scientific aspect where relevant. Considering the fact of having few consolidated data, poorly structured and not always standardized, an extremely significant territorial variable, a blurred boundary between activities carried out for individual purposes and activities carried out at the level and for institutional purposes, the Commission of Experts for the evaluation of the Third Mission (CETM) in its final report, suggests that the evaluation of the third mission cannot disregard qualitative analysis and increasingly orient itself towards case studies and on-site visits in the future. It will thus be possible to study the social consequences of the third mission, the impact and actual benefits for society [25].

1.3   Objective and research question

The objective of the thesis is to identify and present the different initiatives and approaches that the top ten universities from The Times Higher Education Impact Rankings 2020 (THE), are adopting to change the way to address global sustainability challenges, having a positive impact on the territory. Specifically, the aim is to categorize and compare the results obtained in order to understand how the different kinds of activities have been used from the different universities around the world and how these actions could be replicated in other places.

The research question that guides the thesis development process, according to the set objective, is the following:

How are Higher Education Institutions innovating the way for addressing sustainability challenges? How do they impact their territory?

1.4   Methods

To achieve the thesis objective, the research question will be answered through several steps. To map the initiatives that are happening in the top ten universities from The Times Higher Education Impact Rankings 2020 (THE) around the world, the first step consisted in a qualitative content analysis collecting data from keywords searching on the Google Search engine. In particular, the initiatives obtained from the search of the name of the university plus keywords were selected and collected. After this first step, all the programs and initiatives declared from each university web portal have been cataloged according to the three missions of the universities: education (teaching and learning), research, and outreach. The second part of the analysis consisted of dividing declared data according to specific categories drawing from the literature review and interpreting the description of the case studies with an inductive coding approach. The seven categories are: type of initiative, level of impact, pedagogical approach, students involvement, stakeholders involved, strategy, and external funding. The last step was analyzing and comparing results in order to have an overview of the differences and the recurrent features of the collected experiences.

1.5   Thesis outline

The expectation of the thesis is to illustrate the current situation about the action that universities are adopting to face sustainability issues. The work is divided into 4 chapters that are: Introduction, Methodology, Results, and Discussion and Conclusions.

Chapter 1 - Introduction: in this section the topic of the thesis and its objective are presented, in addition to the explanation of the methods used to achieve the results.

The structure of the introduction is as follows: in the first place, an overview of the current sustainability challenges and the 2030 Agenda is given, secondly, the role of the university in the society and its missions are presented, followed by the presentation of the importance of the university in the era of the SDGs and the Italian situation in achieving the third mission.

Chapter 2 - Methodology: in this chapter the methodological approach to achieve the outcome of the thesis is described. The methodological process consists of a series of steps presented in detail in the Chapter 2. At first stage, the top ten universities of the THE Impact Rankings of 2020 were used as a sample for analysing the action and the initiatives that are adopting these universities to innovate the way for addressing sustainability issue and their way to impact the territory. The data collection was performed through a qualitative content analysis from keywords searching on the Google Search engine. Then an inducting coding analysis was used to obtain a reorganization of data according some important recurrent features.

Chapter 3 - Results: this section shows the findings obtained from the data analysis following their categorization: type of initiative, level of impact, pedagogical approach, students involvement, stakeholders involved, strategy, and external funding.

Chapter 4 - Discussion and conclusions: in the last chapter a conclusive summary of the research thesis is presented, with a focus on the Italian situation and on possible future developments.

Chapter 2

Methodology

2.1 Literature review

The first step in order to be able to answer the research question of this thesis and provide a general overview of the topic is to carry out a literature review. It can present the barriers and the different pedagogical approaches that the universities in the world are facing and adopting to have an active role in society and contribute to current challenges, innovating their traditional way of teaching and doing research.

Starting from research studies performed by Ávila et al.[26] it is possible to have an overview of the principal barriers for innovation and sustainable development in universities around the world. The study consisted of an online questionnaire where university representatives and researchers were asked to answer their perception of difficulty in pursuing experiences related to sustainability in their institutions. From the 301 respondents from 172 universities around the world some common characteristics have been found that hinder innovation and sustainability: the administration of the universities is the main barrier that influences the process, followed by a lack of technology, lack of conscience and concern, lack or inefficiency of the environmental committee and a lack of sustainable buildings. This research has identified a set of gaps in knowledge and the fact that sustainability should be part of the campus activities and lead to a partnership with external stakeholders for investments in education, infrastructure, and technological research.

The study by Filho et al. [19], wants to make a reflection about the possible relation between sustainable development policies adopted by the universities and their active efforts in sustainability action. The investigation of 35 universities in seven different countries, based on the information available or provided by them, shows that, although only 60% of the analyzed universities have a policy directly addressing sustainable development, the remaining universities have engagement in sustainability activities or procedures in other ways. The research confirms the fact that sustainable development policies are not a precondition for the involvement of universities in action but at the same time, the universities with these policies have a higher probability to be active in sustainability initiatives.

Among the current efforts that universities have to face, there is certainly a way to teach and address the problems related to sustainability. The article of Coleman [27] highlights how the service-learning pedagogy can be used for integrating complex problems such as climate change into university courses, increasing students' knowledge and awareness on this topic. According to [28], service learning is "A form of experiential education in which students engage in activities that address human and community needs together with structured opportunities for reflection designed to achieve desired learning outcomes." The results of the study underline the importance of service-learning as a tool not only to teach the students complex sustainability and climate change issues but also to encourage students to take action.

In the same way, a study performed by Castro [29] describes the results obtained by a group of 20 undergraduate students from various disciplines in a university in Mexico, in the resolution of challenges related to the Sustainable Development Goals of the United Nations. The used approach is Challenge-Based Learning (CBL) defined as a new pedagogical approach characterized by the existence of a complete proposal design to solve real-world problems for the benefit of a group or community [30]. The research shows the advantage of CBL on the motivation of the students in finding solutions to real, local, or global problems, but at the same time emerges the difficulty of students to develop initiatives to sustainable development challenges and the need to training students during their careers.

2.2   The case studies sample

The main purpose of this thesis is to map what is happening in worldwide universities in regard to the impact on sustainability implementation. In a world where challenges such as gender inequality, quality education for all, climate change, achieving peaceful societies, and economic growth, are increasingly current and more and more discussed, what are universities doing to incorporate these global issues into their governance? And how can we measure the real impact that universities are making on their students and wider communities?

The study starts from the selection of the case studies to be analyzed from The Times Higher Education Impact Rankings 2020 (THE), which is the only global performance table that assesses universities against the United Nations' Sustainable Development Goals (SDGs) to highlight the institutions that are working hard to tackle global issues.

The ranking is the result of calibration among several indicators across four broad areas: research (creating research in relevant topics related to SDGs), stewardship (the way in which universities are custodians of significant resources), outreach (the work that universities do with their local, regional, national and international communities) and teaching (ensuring that there are enough skilled practitioners to deliver on the SDGs, and in making sure that all alumni take forward the key lessons of sustainability into their future careers).

Universities have to submit their data according to their works in the different SDGs and the performance of each of them is evaluated according to a series of metrics. The final score of a university is calculated by combining its score in SDG 17 with its top three scores out of the remaining 16 SDGs. SDG 17 accounts for 22% of the overall score, while the other SDGs each carry a weight of 26%. This means that different universities are scored based on a different set of SDGs, depending on their focus. The score from each SDG is scaled so that the highest score in each SDG in the overall calculation is 100. This is to adjust for minor differences in the scoring range in each SDG and to ensure that universities are treated in the same way, whichever SDGs they have provided data for. These scaled scores are used to determine which SDGs a university has performed most strongly in; they may not be the SDGs in which the university is ranked highest or

Rank	Name	Country	Number of students	SDGs
1	University of Auckland	New Zealand	44,000	15, 14, 3, 17
2	University of Sydney	Australia	73,000	11, 15, 8, 17
3	Western Sydney University	Australia	42,000	15, 5, 12, 17
4	La Trobe University	Australia	37,000	5, 3, 8, 17
5	Arizona State University (Tempe)	United States	75,000	1, 14, 15, 17
6	University of Bologna	Italy	87,600	16, 1, 8, 17
7	University of British Columbia	Canada	66,750	14, 13, 15, 17
8	University of Manchester	United Kingdom	40,500	12, 9, 11, 17
9	King's College London	United Kingdom	33,100	11, 3, 16, 17
10	RMIT University	Australia	85,000	10, 8, 11, 17

Table 2.1: Top ten University according to THE ranking

has scored highest based on unscaled scores.

In the second edition of the year 2020, there is the participation of 768 universities from 85 countries. At the top of the list, there is New Zealand's University of Auckland, while three Australian universities complete the rest of the top four: University of Sydney, Western Sydney University, and La Trobe University. Specifically for the following research, the top ten universities in the ranking are taken into consideration for the analysis. The name of the university, the country of location, the number of students, and the SDGs in which they have the greatest impact are presented in Table 2.1.

2.3 Data collection

To map the initiatives that are happening in the top ten universities from The Times Higher Education Impact Rankings 2020 (THE) around the world, the

first step consists of a qualitative content analysis to collect data from keywords searching on the Google Search engine. In particular, all the initiatives obtained from the search of the name of the university plus keywords resulting from their institutional website were selected and collected. The second part of the data collection summarizes the qualitative analysis started from The THE rankings survey and then interpreting the description of the case studies with an inductive coding approach. The final results are grouped in the kind of macro-areas drawing from the literature review. Instead of defining what universities should do, the study presents a qualitative and comparative exploration, to observe what is happening in the actual system of HEIs,

2.3.1 Qualitative content analysis

Content analysis is a group of systematic, rule-guided techniques used to analyze the informational contents of textual data [31]. There are several types of content analysis including both quantitative and qualitative methods all sharing the central characteristic of systematically categorizing textual data in order to make sense of it [32].

In this thesis, a qualitative method aimed at reading, organizing, and reporting data collected from the institutional website of each university is adopted in order to describe the current strategies related to the implementation of the sustainability impact. The primary source of data, in fact, are the declared activities presented on the websites of the various universities. A limitation is due precisely to the fact that the data collected is based exclusively on the information that the universities have decided to publish on their institutional web pages. To collect initiatives of interest, it was decided to search on the Google search engine for the name of the university plus various keywords derived from the themes that emerged in the introduction and literature review of this research. The five keywords selected are:

(a) **Social impact**: reconnecting to the importance of the third university mission and referring to the definition of Stanford University, it is about how organizations' actions affect the surrounding community. In the Stanford context, organizations are students and actions are how the university are applying the skills to affect the surroundings territories;

(b) **Service learning**: it is a pedagogical approach used to combine learning objectives with community service and, according to [28] already cited in the literature review, it is "a form of experiential education in which students engage in activities that address human and community needs together with structured opportunities for reflection designed to achieve desired learning outcomes.";

(c) **Sustainability education**: since one of the most important goals of the thesis is finding best practices in addressing complex sustainability issues, it is referred to the way in which individuals are trained and educated on sustainable practices and development;

(d) **Climate emergency**: according to Oxford Dictionaries, climate emergency can be defined as "a situation in which urgent action is required to reduce or halt climate change and avoid potentially irreversible environmental damage resulting from it". In this study, the actions supported by universities to address this urgent global threat are considered essential to have a general picture of the current situation;

(e) **Challenge-based learning**: referring to the importance of students and the university, in general, to approach the real problems of the world in order to find concrete solutions, it is defined as a new pedagogical approach characterized by the existence of a complete proposal design to solve real-world problems for the benefit of a group or community [30].;

Once the initiatives have been collected, deciding the way in which displaying qualitative data is an important step: for this study, a matrix that is essentially the intersection between rows and columns summarizing all the data collected is used. In the rows there is the name of the universities, in the columns, there are the five keywords and in the intersections, the names of the initiatives found for each keyword (Tables 2.2, 2.3). In total, the initiatives found in this research to be analyzed are 109. In the next steps, all the programs and initiatives of each university will be cataloged according to the three missions of the universities: education (teaching and learning), research, and outreach (third mission). In fact, as explained in the introduction of the thesis the university's mission is threefold

and while the traditional missions of education and research are easy to interpret and catalog, the third mission refers to a set of activities and actions not always easily distinguishable. Moreover, many times an initiative born with the aim of educating or doing research involuntarily falls back into having an impact outside the university. Trying to make this categorization, can help to understand which of the three missions is prevalent in each university among the top ten in the ranking on the basis of the data collected.

Rank	University	Keyword *"Social impact"*	Keyword *"Service learning"*
1	University of Auckland (New Zealand)	Research Impact competition Research Communication, influence and impact Campaign For All Our Futures	Volunteer Impact Week
2	University of Sydney (Australia)	The Social Impact Scholarship (MBA) Connect for: A better future program Research with impact TEDx Sydney	Service Learning in Indigenous Communities
3	Western Sydney University (Australia)	Research with Impact	
4	La Trobe University (Australia)	Research Impact at La Trobe	Service Learning in the Community
5	Arizona State University -Tempe (United States)	Social Impact Measurement & Management Social Impact Measurement Certificate Interdisciplinary Solutions for Social Impact (Workshop: Impacting Inequality Labs)	ASU-University service learning Arizona Service Enterprise Initiative
6	University of Bologna (Italy)	Third Mission Program AlmaEngage	Service Learning and community engagement Lab
7	University of British Columbia (Canada)	UBC Social Impact Fund Centre for Social Innovation & Impact Investing (UBC Sauder)	Community Service Learning Program (CSL) Volunteering opportunities Program Be The Change Earth Alliance (BTCEA) Students Group Initiative
8	University of Manchester (United Kingdom)	Social responsibility strategic plan 10,000 Actions initiative	Students' Union Volunteers Volunteer Hub
9	King's College London (United Kingdom)	Research & Innovation creating impact Making sense of the impact on society SERVE-Service Annual Report	King's Volunteering
10	RMIT University (Australia)	RMIT Social Innovation Hub Social change research RMIT Social and Global Studies Centre	Volunteer at RMIT RMIT University Student Union

Table 2.2: Matrix of case studies initiatives asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) - Part 1

Keyword *"Sustainability education"*	Keyword *"Climate emergency"*	Keyword *"Challenge-based learning"*
University of Auckland Annual Report Studying sustainability (courses and modules) Sustainability-Take action! SDG 4 Hub	Ingenio Spring 2020 Annual report (climate action section)	
Courses in sustainability Industry and community projects program Open Learning Environment Sustainability Strategy 2020 Sustainable Development Goal 2020	Climate change: the convergence of crisis (Podcast) Sustainable Development Goal 2020 (climate action section) Sydney Environment Institute	Student Innovation Challenge Grand Challenges program
RCE Greater Western Sydney CORE Framework-Sustainability education Sustainability Programs at Western UNAI World Hub SDG 10	Climate Action program Action plan-Resilience & Climate Change	Problem Based Learning RefQuest
Courses in sustainability Green Impact project Future Ready Strategy	La Trobe Climate Network Net zero project	Industry Innovation Challenge
ASU Sustainability Education Sustainability Connect collaboration Rob and Melani Walton Sustainability Solutions Julie Ann Wrigley Global Futures Laboratory Global Institute of Sustainability and Innovation ASU Project Cities	Urban Climate Research Center	The Challenge 2020
Multicampus Sostenibile AlmaGoals Foundation for Urban Innovation - FIU Reporting on UN SDGs Green Office dell'ALma Mater (GOAL)	AlmaGoals: Climate Action	IDEA
EFS in Action Institute for Resources, Environment and Sustainability UBC Sustainability Initiative	UBC climate emergency engagement UBC Climate Hub Climate Action Plan	
School of Environment, Education and Development Teaching and learning initiatives Environmental Sustainability strategy Sustainability Challenge	Tyndall Manchester Climate Change and Society unit course Applied Sustainability Projects programme	
Sustainability-Research and Education Environmental Science for Sustainability MSc KCL Sustainability Extracurricular Opportunities-Sustainability	King's Climate Action Network King's Climate Hub	Active learning at King's King's Civic Challenge
RUSU-Sustainability department RMIT-Sustainability	Research Project Climate Action	

Table 2.3: Matrix of case studies initiatives asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) - Part 2

University of Auckland

The University of Auckland[1] (Waipapa Taumata Rau) is New Zealand's largest and leading university, with a student population of 44,000 on five Auckland campuses. This includes 8,000 international students representing over 120 countries. Founded in 1883, it is part of the Association of Commonwealth Universities. Retaining a

---

[1]https://www.auckland.ac.nz

EDUCATION	RESEARCH	OUTREACH (THIRD MISSION)
• Research Communication, influence, and impact	• Research Impact competition	• Research Impact competition
• Volunteer Impact Week	• Campaign For All Our Futures	• Research Communication, influence, and impact
• Studying sustainability (courses and modules)	• UNAI World SDG 4 Hub	• Campaign For All Our Futures
• Sustainability-Take action!		• Volunteer Impact Week
• SDG 4 Hub		• University of Auckland Annual Report
• Ingenio Spring 2020		• UNAI World SDG 4 Hub

Table 2.4: University of Auckland - categorization of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach
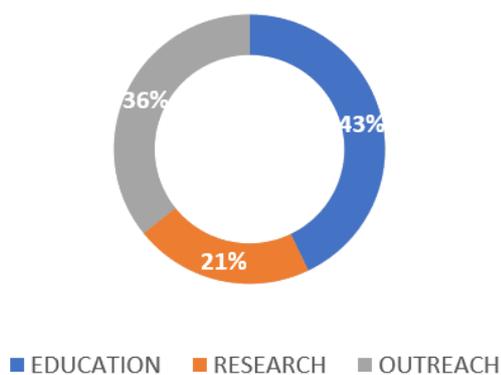
Figure 2.1: University of Auckland - percentage of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach

position in the top ten reaffirms the University of Auckland's strong commitment to sustainability and making a positive social impact through its partnerships, research, teaching, operations, community engagement, and knowledge transfer. In 2020 it was 179th in the World University Rankings (THE), among almost 1,400 universities across 92 countries.

From the categorization of the data obtained from the research of the university initiatives (figure 2.1), it is possible to state that most of the actions carried out, fall within the education sector (43%), followed by the third mission (36%), and finally, there is research with 21%.

University of Sydney (USYD)

The University of Sydney[2] is Australia's oldest university, founded in Sydney in 1850 and inspired by the Oxbridge principles, believing in the power of education to inspire positive change. The university excels across an incredible breadth and depth of subjects and disciplines, from arts to architecture, engineering to

---

[2]https://www.sydney.edu.au/

EDUCATION	RESEARCH	OUTREACH (THIRD MISSION)
• The Social Impact Scholarship (MBA)	• Research with Impact	• Connect for: A better future program
• Connect for: A better future program	• Sustainability Strategy 2020	• TEDx Sydney
• Service Learning in Indigenous Communities	• Sydney Environment Institute	• Service Learning in Indigenous Communities
• Courses in sustainability		• Industry and community projects program
• Industry and community projects program		• Sustainable Development Goal 2020 Report
• Open Learning Environment		
• Sustainability Strategy 2020		
• Climate change: the convergence of crisis (Podcast)		
• Sydney Environment Institute		
• Student Innovation Challenge		
• Grand Challenges program		

Table 2.5: University of Sydney - categorization of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach
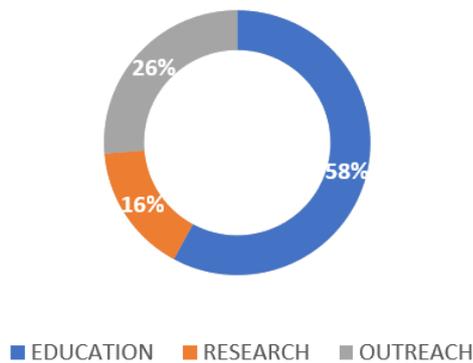
Figure 2.2: University of Sydney - percentage of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach

education, geography to technology. The University is consistently at the forefront of pioneering research and is recognized for its support of early career researchers and student entrepreneurs in taking their big ideas to the next level. This continued excellence in research and teaching makes the USYD one of the top universities in Australia and highly ranked among universities globally. In 2020 it was 60th in the World University Rankings (THE), the first Australian one.

The categorization (figure 2.2) shows that more than half of the activities found are related to education (58%), while 26% are related to the third mission and 16% to research.

Western Sydney University (WSU)

Western Sydney University[3], formerly the University of Western Sydney, is an Australian multi-campus university in the Greater Western region of Sydney. The university in its current form was founded in 1989 as a federated network university with an amalgamation between the Nepean College of Advanced Education and the Hawkesbury Agricultural College. WSU is globally recognized for its research strengths and innovations in teaching. The university values academic excellence,

---

[3]`https://www.westernsydney.edu.au/`

integrity, and the pursuit of knowledge. Ranked in the top two percent of unis in the world (251-300th in 2020), it is focused on making a positive impact on the communities.

The figure 2.3 points out that almost half of the initiatives are related to education (44%), followed by research and third mission almost at the same level (31% the first and 25% the second).

EDUCATION
- RCE Greater Western Sydney
- CORE Framework-Sustainability education
- Sustainability Programs at Western
- Climate Action program
- Action plan-Resilience & Climate Change
- Problem Based Learning
- RefQuest

RESEARCH
- Research with Impact
- CORE Framework-Sustainability education
- UNAI World Hub SDG 10
- Climate Action program
- Action plan-Resilience & Climate Change

OUTREACH (THIRD MISSION)
- RCE Greater Western Sydney
- CORE Framework-Sustainability education
- UNAI World Hub SDG 10
- Climate Action program

Table 2.6: Western Sydney University - categorization of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach
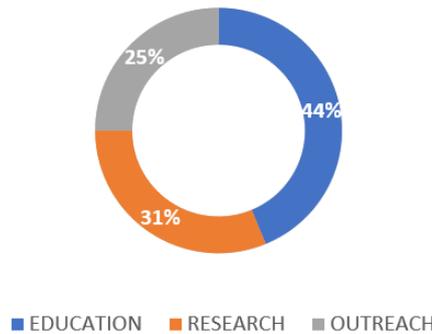
Figure 2.3: Western Sydney University - percentage of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach

EDUCATION	RESEARCH	OUTREACH (THIRD MISSION)
• Service Learning in the Community • Green Impact project • Future Ready Strategy • Courses in sustainability • Industry Innovation Challenge	• Research Impact at La Trobe • La Trobe Climate Network • Net zero project	• Service Learning in the Community

Table 2.7: La Trobe University - categorization of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach

La Trobe University

La Trobe University[4] was founded in 1967 as the third university in the State of Victoria. The name of La Trobe is given in honor of Charles Joseph La Trobe, a general of French origin who was the first governor of the State of Victoria. During the seventies and eighties, the university experienced a great deal of political activity. La Trobe Vice-Chancellor Professor John Dewar AO said the rankings were an outstanding endorsement of the University's commitment to improving quality of life, health outcomes, and the environment through high-impact research, teaching innovation, and meaningful partnerships on a local, national and global scale (251–300th World University Rankings 2020).

From the data found on the institutional website and according to figure 2.4 it is evident that more than half of the activities are related to education (56%), followed by 33% about research and only 11% about the third mission.

Arizona State University (ASU)

The ASU[5] was born in Tempe in 1885 and it is the largest public university in the United States with a student population of approximately 70,000 students. ASU is spread across four campuses in the Phoenix metropolitan area. Arizona State University remains a national leader in addressing sustainability when it comes to

---

[4]https://www.latrobe.edu.au/

[5]https://www.asu.edu/
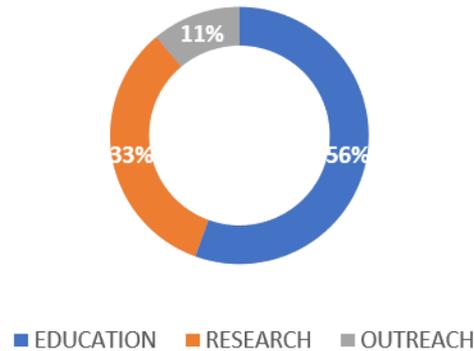
Figure 2.4: La Trobe University - percentage of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach

research, outreach, and stewardship and it is ranked as the first "Most Innovative School" in the United States. Interdisciplinary, solutions-focused approach to research, entrepreneurship and economic development is centered on the discovery that translates into impact and the fusion of intellectual disciplines in order to solve complex problems (155th World University Rankings 2020).

From the research, it is possible to notice that the initiatives that fall into education and the third mission have the same percentage (41%). On the other hand, the actions related to research have only 18% (figure 2.5).

University of Bologna (UNIBO)

The Alma Mater Studiorum - University of Bologna[6], active since the 11th century, is considered by many sources to be the oldest university in the world still in activity. Since its foundation in 1088, the University of Bologna has been student-centered, and, thanks to its five campuses it offers its student a varied course catalog that is tailored to the needs of present-day society: over 200-degree programs within its 32 departments and 5 schools. As a comprehensive research university, UniBo is a multidisciplinary cross-cultural approach to research and teaching, which are

---

[6]https://www.unibo.it/

EDUCATION
- Interdisciplinary Solutions for Social Impact (Workshop: Impacting Inequality Labs)
- ASU-University service learning
- ASU Sustainability Education
- Sustainability Connect collaboration
- Rob and Melani Walton Sustainability Solutions
- Julie Ann Wrigley Global Futures Laboratory
- Global Institute of Sustainability and Innovation
- ASU Project Cities
- The Challenge 2020

RESEARCH
- Rob and Melani Walton Sustainability Solutions
- Julie Ann Wrigley Global Futures Laboratory
- Global Institute of Sustainability and Innovation
- Urban Climate Research Canter

OUTREACH (THIRD MISSION)
- Social Impact Measurement & Management
- Social Impact Measurement Certificate
- ASU-University service learning
- Arizona Service Enterprise Initiative
- Sustainability Connect collaboration
- Rob and Melani Walton Sustainability Solutions
- Julie Ann Wrigley Global Futures Laboratory
- Global Institute of Sustainability and Innovation
- ASU Project Cities

Table 2.8: Arizona State University - categorization of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach
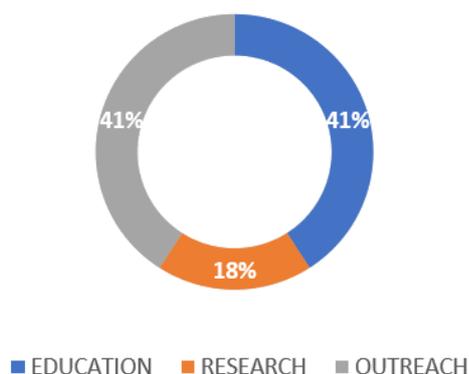

Figure 2.5: Arizona State University - percentage of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach

considered inseparable parts of the same unit. In the European context of research and academic cooperation, the University of Bologna is surely among the most active institutions (168th World University Rankings 2020).

From the data found on the institutional website, it is evident that education

and the third mission invest the majority of initiatives both with the 40%, while the research is characterized by the half of that percentage that is 20% (figure 2.6).

EDUCATION	RESEARCH	OUTREACH (THIRD MISSION)
• Third Mission Program	• Multicampus Sostenibile	• Third Mission Program
• AlmaEngage	• AlmaGoals	• AlmaEngage
• Service Learning and community engagement Lab	• AlmaGoals: Climate Action	• Service Learning and community engagement Lab
• AlmaGoals		• AlmaGoals
• Foundation for Urban Innovation – FIU		• Foundation for Urban Innovation – FIU
• AlmaGoals: Climate Action		• AlmaGoals: Climate Action
• CBI - Challenge Based Innovation		• CBI - Challenge Based Innovation
		• Green Office

Table 2.9: University of Bologna - categorization of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach


■ EDUCATION ■ RESEARCH ■ OUTREACH
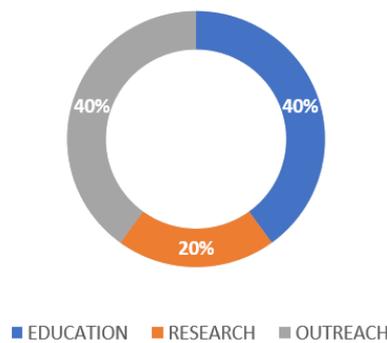
Figure 2.6: University of Bologna - percentage of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach

University of British Columbia (UBC)

The University of British Columbia[7], formerly known as McGill University College of British Columbia, has well-established traditions in interdisciplinary research, dating back to its founding in 1908. This Canadian research institute is considered a high-quality academic authority and often ranks highly among world universities. As one of the oldest universities in Canada, the institution faced rapid expansion in the 20th century and broadened its catalog of degrees considerably, which had originally concentrated on medicine, theology, and law. The University of British Columbia is ranked number one in the world for taking urgent action to combat climate change and its impacts and ranked one in Canada for making cities inclusive, safe, resilient, and sustainable (34th World University Rankings 2020).

The 43% of activities are based on education, followed by 35% in third mission activities and 22% in research (figure 2.7).

EDUCATION	RESEARCH	OUTREACH (THIRD MISSION)
• Community Service-Learning Program (CSL)	• Centre for Social Innovation & Impact Investing	• UBC Social Impact Fund
• Volunteering opportunities Program	• Institute for Resources, Environment and Sustainability	• Centre for Social Innovation & Impact Investing
• Be the Change Earth Alliance (BTCEA)	• UBC Sustainability Initiative	• Community Service-Learning Program (CSL)
• Students Group Initiative	• UBC climate emergency engagement	• Volunteering opportunities Program
• EFS in Action	• Climate Action Plan	• Be the Change Earth Alliance (BTCEA)
• Institute for Resources, Environment and Sustainability		• EFS in Action
• UBC Sustainability Initiative		• UBC Sustainability Initiative
• UBC climate emergency engagement		• UBC climate emergency engagement
• UBC Climate Hub		
• Climate Action Plan		

Table 2.10: University of British Columbia - categorization of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach

**Figure 2.7:** University of British Columbia - percentage of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach

University of Manchester

Part of the prestigious Russell Group of universities, The University of Manchester[8] is the largest single-site university in the UK, with the biggest student population.

---

[7]https://www.ubc.ca/

[8]https://www.manchester.ac.uk/

EDUCATION	RESEARCH	OUTREACH (THIRD MISSION)
• Social responsibility strategic plan	• Social responsibility strategic plan	• Social responsibility strategic plan
• 10,000 Actions initiative	• School of Environment, Education and Development	• 10,000 Actions initiative
• Students' Union Volunteers	• Teaching and learning initiatives	• Students' Union Volunteers
• Volunteer Hub	• Environmental Sustainability strategy	• Volunteer Hub
• School of Environment, Education and Development	• Tyndall Manchester	• Applied Sustainability Projects programme
• Teaching and learning initiatives		
• Environmental Sustainability strategy		
• Sustainability Challenge		
• Climate Change and Society unit course		
• Applied Sustainability Projects programme		

Table 2.11: University of Manchester - categorization of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach
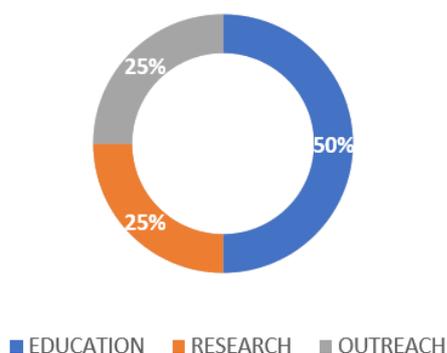
Figure 2.8: University of Manchester - percentage of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach

The University of Manchester is a place where research has an international impact, where students experience outstanding teaching and learning, transforming into employable graduates, and where all activity is enriched by a commitment to social responsibility and the benefits of society and the environment. In 2020 it was 55th in the World University Rankings (THE).

According to the figure 2.8, activities related to education represent 50% of the total, while the remaining half is divided by 25% between the third mission and research.

King's College London (KCL)

King's College London[9] is one of the two founding colleges of the University of London, the sister college of University College London. Established in 1829 by King George IV and the Duke of Wellington, the then Prime Minister, it is the fourth oldest university in England. KCL is a major research university. In the 2014 Research Excellence Framework, it was ranked 6th nationally in the 'power' ranking, which takes into account the quality and quantity of research activity, and ranks among the top institutions in THE World University Rankings. King's

---

[9]https://www.kcl.ac.uk/

successfully delivers against SDGs through cross-sectoral dialogue with government bodies and NGOs, international collaboration and research, local and global student volunteering programs, and commitment to service-learning and civic engagement (36th World University Rankings 2020).

The categorization showed in figure 2.9, points out that almost half of the activities (43%), are embedded in education, and the remaining half is divided between research (28%) and third mission (29%).

RMIT University

With an emphasis on technology, design, and enterprise, RMIT University[10] in Melbourne was originally established as a Working Men's College in 1887 and was granted formal university status in 1992. The university also runs an industry mentoring program linking professionals with current students for one-to-one advice. RMIT has six core values that are: passion, impact, inclusion, agility, courage, and imagination, and a global reputation for excellence in professional and vocational education, applied research, and engagement with the needs of industry and

---

[10]https://www.rmit.edu.au/

EDUCATION	RESEARCH	OUTREACH (THIRD MISSION)
• SERVE-Service Annual Report	• Research & Innovation creating impact	• Research & Innovation creating impact
• King's Volunteering	• Making sense of the impact on society	• Making sense of the impact on society
• Sustainability-Research and Education	• SERVE-Service Annual Report	• SERVE-Service Annual Report
• Environmental Science for Sustainability MSc	• Sustainability-Research and Education	• King's Volunteering
• KCL Sustainability	• King's Climate Action Network	• Extracurricular Opportunities-Sustainability
• Extracurricular Opportunities-Sustainability	• King's Climate Hub	• King's Civic Challenge
• King's Climate Action Network		
• Active learning at King's		
• King's Civic Challenge		

Table 2.12: King's College London - categorization of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach
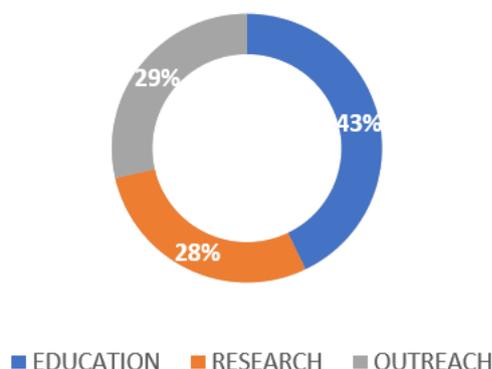
Figure 2.9: King's College London - percentage of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach

communities worldwide. In 2020 it was 351-400th in the World University Rankings (THE).

In this case, all the three categories of research, education, and third mission have almost the same percentage, respectively 33%, 34%, and 33% (figure 2.10).

General overview

From this first analysis, it emerged that almost all universities have more actions in the field of education, followed by third mission's initiatives and finally research

EDUCATION	RESEARCH	OUTREACH (THIRD MISSION)
• Volunteer at RMIT	• Social change research	• RMIT Social Innovation Hub
• RMIT University Student Union	• RMIT Social and Global Studies Centre	• RMIT Social and Global Studies Centre
• RUSU-Sustainability department	• RMIT-Sustainability	• Volunteer at RMIT
• RMIT-Sustainability	• Research Project Climate Action	• RMIT-Sustainability

Table 2.13: RMIT University - categorization of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach

41
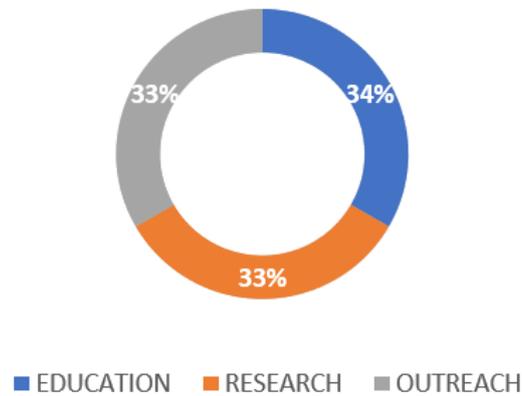
Figure 2.10: RMIT University - percentage of initiatives preselected from the query asking for keywords (social impact, service learning, sustainability education, climate emergency, challenge-based learning) and falling in the classification of education, research and outreach

activity. The results can explain the interlinkages among the three missions of the university and the fact that many of the initiatives linked to education and research have a social impact because they automatically involve the surrounding area and other stakeholders. Since the objective of the thesis is to find best practices that can be replicated elsewhere, the research continues with a more accurate analysis taking into account other factors of interest for the actions that the university is supporting to address the challenges of sustainability.

2.4 Data analysis

Coding is the process of labeling and organizing the qualitative data to identify different themes and the relationships between them. Inductive research involves the conversion of raw, qualitative data into more useful quantitative data, not testing a pre-conceived hypothesis, but allowing the theory to emerge. According to [33], inductive analysis refers to "approaches that primarily use detailed readings of raw data to derive concepts, themes, or a model through interpretations made from the raw data by an evaluator or researcher."

The second phase of this research wants to present a raw data reorganization

using an inducting coding analysis. Starting from the review of the declared initiatives on the institutional websites, they are reorganized according to the recurrent features, some of them drawing from specific categories mentioned in the literature review. The categories that emerged from the reading of the data under examination are explained below.

– Type of initiative → refers to the scope to which it extends and could give information about its durability over time –

- Curricular initiative: related to the subjects taught in the university career with the duration of an entire academic period (a semester, a year, etc.);

- Series of initiatives: it refers to a program that develops in multiple activities and actions, most of the time over a not defined and limited period of time;

- Single initiative: if it is an individual activity organized for a specific purpose and therefore could have a limited duration which can be a day, a week, etc.

– Level of impact → refers to the scale of impact that the initiative has, in terms of how it affects the internal/external environment –

- University course level: if the initiative is circumscribed within teaching and learning curricula;

- University unit level: it refers to a program that develops in a single unit that could be a department, a team, a research center, etc., without having interaction with the other units;

- Intra-university level: if there is engagement within the university community and between departments, teams, research centers, etc., in the same university;

- Territorial level: if the action is not circumscribed within the university borders but it has an impact on the territory, sometimes also with the interaction of external stakeholders.

– Pedagogical approach → refers to the broad principles and methods of education used in teaching practice –

- Lectures: it is a teaching-learning strategy where instructors directly communicate curricular information to students and it is also the most common teaching strategy employed in Higher Education [34];

- Project-based approach: "in project-based learning, students work in groups to solve challenging problems that are authentic, curriculum-based, and often interdisciplinary. Learners decide how to approach a problem and what activities to pursue." [35]. It does not require the involvement of the technology inside the process but is just a critical thinking exercise.

- Challenge-based approach: "Challenge-based learning builds on the practice of problem-based learning, in which students work on real-world problems in collaborative teams, but with key distinctions that add a great deal of relevancy for students . At the center of challenge-based learning is a call to action that inherently requires students to make something happen. They are compelled to research their topic, brainstorm strategies and solutions that are both credible and realistic in light of time and resources, and then develop and execute one of those solutions that addresses the challenge in ways both they themselves and others can see and measure." [36];

- Experiential learning: is the process of learning through experience, and is more narrowly defined as "learning through reflection on doing" [37].

- Dissemination: the university's intent is to spread knowledge, and information on the research and program results undertaken. According to the article [38], dissemination is a methodology for learning and teaching developments that must be adaptable and involve an array of stakeholders engaged in multiple domains, intersecting communities of practice that may be supportive or resistant.

- Serious game: "represents an important opportunity for improving education thanks to its ability to compel players and to present realistic simulations of real-life situations." [39].

– **Students involvement** → **explains if the initiative requires the participation of students or if it does not concern them (yes/no)** –

– Stakeholders involved → specifies, if any, the type of external stakeholders involved in the initiative (the symbol \means that the information is not available) –

- Non-governmental organizations (NGOs): organizations that are independent of government involvement. NGOs, sometimes called civil societies, are organized on community, national and international levels to serve a social or political goal such as humanitarian causes or the environment;

- Governmental organizations (GOs): they are often government-appointed groups, they can be permanent or semi-permanent organizations and are funded by the government. A government agency may be created by either a national government or a state government within a federal system;

- Intergovernmental organizations (IGOs): refers to entities created by treaty, involving two or more nations, to work in good faith, on issues of common interest;

- Non-profit organizations (NPOs): are legal entities organized and operated for a collective, public or social benefit, in contrast with an entity that operates as a business aiming to generate a profit for its owners. Any revenues that exceed expenses must be committed to the organization's purpose, not taken by private parties;

- City council: is a municipal body having legislative and administrative powers, such as passing ordinances and appropriating funds;

- Companies: are legal entities formed by a group of individuals to engage in and operate a business enterprise in a commercial or industrial capacity;

- Citizens associations: are membership groups of people that serve a specific purpose with respect to a specific community or a group of homeowners in a specific geographic area. Some associations are voluntary, some are mandatory (like homeowners' associations whose rules require membership in the association);

- Other universities: collaboration among more academic institutions.

– **Strategy → refers to the direction of the process for initiating and developing the activity –**

- Mandatory based: if the initiative is part of the academic program and is proposed by the university institution and authorities and the people involved have to comply with the mandatory rules;

- Voluntary based: is an initiative that could be organized by students or university staff and associations and it is possible to decide if participate or not;

- Competition: is an organized event in which students/researchers/teams try to win a prize proposing the best solution on a topic.

– **External funding → describes if the initiative benefits of other external funds in addition to those of the university (yes/no, the symbol \means that the information is not available). –**

2.5   Limitations

One of the most relevant limitations of this work is the fact that the data collection derives only from the publications of the initiatives self-declared on the web pages of each university. Having no other source of data may mean that the results will be influenced by what each university has decided to make public. In addition, as the research is based only on the top ten universities according to THE Impact Ranking, and most of them belong to the same nation, it can result in a partial view of the entire global system.

The examples analyzed, even if have been taken from THE rankings, do not mean that they are the best examples in the world. It could happen that many universities are supporting better actions but are not interested in communicating their results to THE rankings. Maybe they are more interested in communicating their outcomes only through their own channels or they do not have the culture of sharing ideas and initiatives.

INITIATIVE	TYPE OF INITIATIVE	LEVEL OF IMPACT	PEDAGOGICAL APPROACH	STUDENTS INVOLVEMENT	STAKEHOLDERS INVOLVED	STRATEGY	EXTERNAL FUNDING
Research Impact competition	Single initiative	Territorial level	Dissemination	No	/	Competition	/
Research Communication, influence, and impact	Curricular program initiative	University unit level	Dissemination	Yes	No	Voluntary based	No
Campaign for All Our Futures	Series of initiatives	Intra-university level	Dissemination	Yes	/	Voluntary based	Yes
Volunteer Impact Week	Single initiative	Territorial level	Experiential learning	Yes	NGOs, non-profit organisations, citizens associations	Voluntary based	/
University of Auckland Annual Report	Single initiative	Intra-university level	Dissemination	Yes	No	Mandatory based	No
Studying sustainability	Curricular program initiative	University course level	Lectures	Yes	No	Mandatory based	No
Sustainability-Take action!	Series of initiatives	Territorial level	Experiential learning	Yes	/	Voluntary based	/
SDG 4 Hub	Series of initiatives	Territorial level	Experiential learning/ dissemination	Yes	Intergovernmental organization	Mandatory based	Yes
Ingenio Spring 2020	Single initiative	Intra-university level	Dissemination	Yes	No	Voluntary based	/
Annual report (climate action section)	Single initiative	Intra-university level	Dissemination	Yes	No	Mandatory based	No

Table 2.14: University of Auckland initiatives categorization according type of initiative, level of impact, pedagogical approach, students involvement, stakeholders involved, strategy, and external funding. Initiatives' websites links in Appendix A.1

INITIATIVE	TYPE OF INITIATIVE	LEVEL OF IMPACT	PEDAGOGICAL APPROACH	STUDENTS INVOLVEMENT	STAKEHOLDERS INVOLVED	STRATEGY	EXTERNAL FUNDING
The Social Impact Scholarship (MBA)	Curricular program initiative	University course level	Lectures/experiential learning	Yes	/	Voluntary based	Yes
Connect for: A better future program	Series of initiatives	Intra-university level	Project-based	Yes	Companies, governmental organization	Voluntary based	/
Research with impact	Series of initiatives	Territorial level	Dissemination	No	/	Mandatory based	No
TEDx Sydney	Single initiative	Territorial level	Dissemination	No	/	Mandatory based	/
Service Learning in Indigenous Communities	Series of initiatives	Territorial level	Experiential learning	Yes	Citizens associations	Voluntary based	/
Courses in sustainability	Curricular program initiative	University course level	Lectures	Yes	No	Mandatory based	No
Industry and community projects program	Series of initiatives	Territorial level	Challenge- based	Yes	Companies, governmental organization	Voluntary based	/
Open Learning Environment	Curricular program initiative	University course level	Lectures	Yes	No	Voluntary based	No
Sustainability Strategy 2020	Single initiative	Intra-university level	Dissemination	Yes	No	Mandatory based	No
Sustainable Development Goal 2020	Single initiative	Intra-university level	Dissemination	Yes	No	Mandatory based	No

Table 2.15: University of Sydney initiatives categorization according type of initiative, level of impact, pedagogical approach, students involvement, stakeholders involved, strategy, and external funding. Initiatives' websites links in Appendix A.2

INITIATIVE	TYPE OF INITIATIVE	LEVEL OF IMPACT	PEDAGOGICAL APPROACH	STUDENTS INVOLVEMENT	STAKEHOLDERS INVOLVED	STRATEGY	EXTERNAL FUNDING
Research with Impact	Series of initiatives	Territorial level	Dissemination	No	No	Mandatory based	No
RCE Greater Western Sydney	Series of initiatives	Territorial level	Dissemination	No	City councils, other universities, environmental centres, companies	Mandatory based	/
CORE Framework- Sustainability education	Series of initiatives	Intra-university level	Lectures/ experiential learning/ dissemination	Yes	/	Mandatory based	/
Sustainability Programs at Western	Curricular program initiative	University course level	Lectures	Yes	No	Mandatory based	No
UNAI World Hub SDG 10	Series of initiatives	Territorial level	Experiential learning/ dissemination	Yes	Intergovernmental organization	Mandatory based	Yes
Climate Action program	Curricular program initiative	Territorial level	Lectures/ dissemination	Yes	City councils, other universities	Mandatory based	/
Action plan- Resilience & Climate Change	Series of initiatives	Intra-university level	Dissemination	Yes	City councils	Mandatory based	/
Problem Based Learning	Curricular program initiative	University course level	Project-based/lectures	Yes	No	Voluntary based	No
RefQuest	Series of initiatives	University unit level	Serious game	Yes	/	Voluntary based	/

Table 2.16: Western Sydney University initiatives categorization according type of initiative, level of impact, pedagogical approach, students involvement, stakeholders involved, strategy, and external funding. Initiatives' websites links in Appendix A.3

INITIATIVE	TYPE OF INITIATIVE	LEVEL OF IMPACT	PEDAGOGICAL APPROACH	STUDENTS INVOLVEMENT	STAKEHOLDERS INVOLVED	STRATEGY	EXTERNAL FUNDING
Research Impact at La Trobe	Series of initiatives	Territorial level	Dissemination	No	/	Mandatory based	No
Service Learning in the Community	Series of initiatives	Territorial level	Experiential learning	Yes	Non-profit organisation, citizens associations	Voluntary based	/
Courses in sustainability	Curricular program initiative	University course level	Lectures	Yes	No	Mandatory based	No
Green Impact project	Series of initiatives	Intra-university level	Dissemination	Yes	/	Voluntary based	/
Future Ready Strategy	Series of initiatives	Intra-university level	Dissemination	Yes	/	Mandatory based	/
La Trobe Climate Network	Series of initiatives	Intra-university level	Dissemination	No	No	Mandatory based	No
Net zero project	Series of initiatives	Intra-university level	Dissemination	Yes	/	Mandatory based	/
Industry Innovation Challenge	Curricular program initiative	Territorial level	Challenge-based	Yes	Companies	Voluntary based	No

Table 2.17: La Trobe University initiatives categorization according type of initiative, level of impact, pedagogical approach, students involvement, stakeholders involved, strategy, and external funding. Initiatives' websites links in Appendix A.4

INITIATIVE	TYPE OF INITIATIVE	LEVEL OF IMPACT	PEDAGOGICAL APPROACH	STUDENTS INVOLVEMENT	STAKEHOLDERS INVOLVED	DIRECTION OF THE PROCESS	EXTERNAL FUNDING
Social Impact Measurement & Management	Series of initiatives	Territorial level	/	No	Non-profit organisations	Voluntary based	No
Social Impact Measurement Certificate	Series of initiatives	Territorial level	Lectures	No	Companies	Voluntary based	No
Interdisciplinary Solutions for Social Impact	Curricular program initiative	University course level	Project-based	Yes	No	Mandatory based	No
ASU-University service learning	Series of initiatives	Territorial level	Experiential learning	Yes	Non-profit organizations, citizens associations	Voluntary based	/
Arizona Service Enterprise Initiative	Series of initiatives	Territorial level	Lectures	No	Non-profit organisations	Voluntary based	No
ASU Sustainability Education	Curricular program initiative	University course level	Lectures	Yes	No	Mandatory based	No
Sustainability Connect collaboration	Series of initiatives	Territorial level	Experiential learning	Yes	/	Voluntary based	/
Rob and Melani Walton Sustainability Solutions	Series of initiatives	Territorial level	Lectures/experiential learning/project-based and challenge-based	Yes	City council, non-profit organizations, emerging companies	Mandatory based	Yes
Julie Ann Wrigley Global Futures Laboratory	Series of initiatives	Territorial level	Dissemination	No	Companies	Mandatory based	/
Global Institute of Sustainability and Innovation	Series of initiatives	Territorial level	Lectures/experiential learning/project-based and challenge-based	Yes	City councils, international companies, non-profit organisation	Mandatory based	/
ASU Project Cities	Single initiative	Territorial level	Project-based/challenge-based	Yes	Citizens associations, city councils	Voluntary based	/
Urban Climate Research Center	Series of initiatives	Territorial level	Dissemination	No	/	Mandatory based	Yes
The Challenge 2020	Single initiative	University unit level	Challenge-based	Yes	No	Competition	No

Table 2.18: Arizona State University initiatives categorization according type of initiative, level of impact, pedagogical approach, students involvement, stakeholders involved, strategy, and external funding. Initiatives' websites links in Appendix A.5

INITIATIVE	TYPE OF INITIATIVE	LEVEL OF IMPACT	PEDAGOGICAL APPROACH	STUDENTS INVOLVEMENT	STAKEHOLDERS INVOLVED	STRATEGY	EXTERNAL FUNDING
Third Mission Program	Series of initiatives	Territorial level	Dissemination	Yes	City council, companies, cultural associations, health facilities	Mandatory based	/
AlmaEngage	Series of initiatives	Territorial level	Dissemination	No	No	Mandatory based	No
Service Learning and community engagement Lab	Series of initiatives	Territorial level	Experiential learning	Yes	Citizens associations	Voluntary based	No
Multicampus Sostenibile	Series of initiatives	Intra-university level	/	Yes	No	Mandatory based	/
Green Office	Series of initiatives	University unit level	Experiential learning/project-based	Yes	City council	Voluntary based	/
AlmaGoals	Series of initiatives	Intra-university level	/	No	No	Mandatory based	/
Foundation for Urban Innovation - FIU	Series of initiatives	Territorial level	Project-based	Yes	City council, citizens associations	Voluntary based	Yes
Reporting on UN SDGs	Single initiative	Intra-university level	Dissemination	Yes	No	Mandatory based	No
AlmaGoals: Climate Action	Series of initiatives	Territorial level	Lectures/experiential learning/project-based	Yes	City council	Mandatory based	/
IDEA	Series of initiatives	Territorial level	Challenge- based	Yes	Companies	Voluntary based	/

Table 2.19: University of Bologna initiatives categorization according type of initiative, level of impact, pedagogical approach, students involvement, stakeholders involved, strategy, and external funding. Initiatives' websites links in Appendix A.6

INITIATIVE	TYPE OF INITIATIVE	LEVEL OF IMPACT	PEDAGOGICAL APPROACH	STUDENTS INVOLVEMENT	STAKEHOLDERS INVOLVED	STRATEGY	EXTERNAL FUNDING
UBC Social Impact Fund	Series of initiatives	Territorial level	Dissemination	Yes	/	Mandatory based	Yes
Centre for Social Innovation & Impact Investing (UBC Sauder)	Series of initiatives	Territorial level	Lectures/ dissemination	Yes	Citizens associations	Mandatory based	/
Community Service-Learning Program (CSL)	Series of initiatives	Territorial level	Lectures/experiential learning	Yes	Citizens associations	Voluntary based	/
Volunteering opportunities Program	Series of initiatives	Territorial level	Experiential learning	Yes	NGOs, non-profit organisations, citizens associations	Voluntary based	/
Be the Change Earth Alliance (BTCEA)	Series of initiatives	Territorial level	Experiential learning	Yes	Citizens associations	Voluntary based	Yes
Students Group Initiative	Series of initiatives	Territorial level	Experiential learning	Yes	No	Voluntary based	/
EFS in Action	Series of initiatives	Territorial level	Experiential learning/project-base	Yes	City council, sustainability experts	Voluntary based	/
Institute for Resources, Environment and Sustainability	Series of initiatives	Territorial level	Lectures/dissemination	Yes	/	Mandatory based	No
UBC Sustainability Initiative	Series of initiatives	Territorial level	Lectures/experiential learning/project-based/dissemination	Yes	NGOs, companies	Mandatory based	/
UBC climate emergency engagement	Single initiative	University unit level	Dissemination	Yes	/	Mandatory based	No
UBC Climate Hub	Series of initiatives	Territorial level	Experiential learning	Yes	/	Voluntary based	Yes
Climate Action Plan	Single initiative	University unit level	Dissemination	Yes	No	Mandatory based	No

Table 2.20: University of British Columbia initiatives categorization according type of initiative, level of impact, pedagogical approach, students involvement, stakeholders involved, strategy, and external funding. Initiatives' websites links in Appendix A.7

INITIATIVE	TYPE OF INITIATIVE	LEVEL OF IMPACT	PEDAGOGICAL APPROACH	STUDENTS INVOLVEMENT	STAKEHOLDERS INVOLVED	STRATEGY	EXTERNAL FUNDING
Social responsibility strategic plan	Series of initiatives	Territorial level	Dissemination	Yes	Citizens associations	Mandatory based	/
10,000 Actions initiative	Single initiative	University unit level	Experiential learning	Yes	/	Voluntary based	/
Students' Union Volunteers	Series of initiatives	Territorial level	Experiential learning	Yes	NGOs, non-profit organisations, citizens associations	Voluntary based	/
Volunteer Hub	Series of initiatives	Territorial level	Experiential learning	Yes	Citizens associations	Voluntary based	/
School of Environment, Education and Development	Series of initiatives	Territorial level	Lectures/dissemination	Yes	/	Mandatory based	/
Teaching and learning initiatives	Curricular program initiative	University course level	Lectures	Yes	No	Mandatory based	No
Environmental Sustainability strategy	Series of initiatives	Intra-university level	Dissemination	Yes	No	Mandatory based	No
Sustainability Challenge	Series of initiatives	Intra-university level	Project-based	Yes	No	Mandatory based	No
Tyndall Manchester	Series of initiatives	Territorial level	Dissemination	No	Other universities	Voluntary based	/
Climate Change and Society unit course	Curricular program initiative	University course level	Lectures	Yes	No	Mandatory based	No
Applied Sustainability	Series of initiatives	Territorial level	Challenge-based	Yes	NGOs, companies	Mandatory based	/

Table 2.21: University of Manchester initiatives categorization according type of initiative, level of impact, pedagogical approach, students involvement, stakeholders involved, strategy, and external funding. Initiatives' websites links in Appendix A.8

INITIATIVE	TYPE OF INITIATIVE	LEVEL OF IMPACT	PEDAGOGICAL APPROACH	STUDENTS INVOLVEMENT	STAKEHOLDERS INVOLVED	STRATEGY	EXTERNAL FUNDING
Research & Innovation creating impact	Series of initiatives	Territorial level	Dissemination	No	/	Mandatory based	Yes
Making sense of the impact on society	Series of initiatives	Territorial level	Dissemination	No	No	Mandatory based	No
SERVE-Service Annual Report	Single initiative	Intra-university level	Dissemination	Yes	No	Mandatory based	No
King's Volunteering	Series of initiatives	Territorial level	Experiential learning	Yes	Citizens associations	Voluntary based	/
Sustainability-Research and Education	Series of initiatives	Territorial level	Lectures/dissemination	Yes	Other Universities	Mandatory based	/
Environmental Science for Sustainability MSc	Curricular program initiative	University course level	Lectures	Yes	No	Mandatory based	No
KCL Sustainability	Series of initiatives	Intra-university level	Experiential learning	Yes	/	Mandatory based	/
Extracurricular Opportunities-Sustainability	Series of initiatives	Territorial level	Experiential learning	Yes	Citizens associations, companies	Voluntary based	/
King's Climate Action Network	Series of initiatives	Intra-university level	Experiential learning	Yes	Citizens associations	Voluntary based	/
King's Climate Hub	Series of initiatives	Territorial level	Dissemination	No	/	Mandatory based	No
Active learning at King's	Single initiative	University course level	Project-based	Yes	No	Voluntary based	No
King's Civic Challenge	Single initiative	Territorial level	Challenge-based	Yes	Citizens associations, city council	Voluntary based	Yes

Table 2.22: King's College London initiatives categorization according type of initiative, level of impact, pedagogical approach, students involvement, stakeholders involved, strategy, and external funding. Initiatives' websites links in Appendix A.9

55

INITIATIVE	TYPE OF INITIATIVE	LEVEL OF IMPACT	PEDAGOGICAL APPROACH	STUDENTS INVOLVEMENT	STAKEHOLDERS INVOLVED	STRATEGY	EXTERNAL FUNDING
RMIT Social Innovation Hub	Series of initiatives	Territorial level	Dissemination	No	Other universities, companies, citizens associations	Mandatory based	/
Social change research	Series of initiatives	Territorial level	Dissemination	No	Other universities, NGOs, governmental organizations	Mandatory based	/
RMIT Social and Global Studies Centre	Series of initiatives	Territorial level	Dissemination	No	Other universities, NGOs, governmental organizations	Mandatory based	/
Volunteer at RMIT	Series of initiatives	Territorial level	Experiential learning	Yes	Citizens associations	Voluntary based	/
RMIT University Student Union	Series of initiatives	Territorial level	Experiential learning	Yes	/	Voluntary based	Yes
RUSU-Sustainability department	Curricular program initiative	University unit level	Experiential learning	Yes	No	Voluntary based	/
RMIT-Sustainability	Series of initiatives	Intra-university level	Lectures/experiential learning/dissemination	Yes	City councils	Mandatory based	/
Research Project Climate Action	Series of initiatives	Territorial level	Dissemination	No	/	Mandatory based	/

Table 2.23: RMIT University initiatives categorization according type of initiative, level of impact, pedagogical approach, students involvement, stakeholders involved, strategy, and external funding. Initiatives' websites links in Appendix A.10

Chapter 3

Results

This chapter of the thesis is dedicated to presenting and describing the results obtained from the data collection and reorganization. In particular, seven bar charts according to the grouped categories (type of initiative, level of impact, pedagogical approach, students involvement, stakeholders involved, strategy, and external funding) are presented and discussed in order to have an overview and a comparison concerning the different approach between the various universities. The principal aim is to find recurring characters, divergences, and main trends of the aspects taken into consideration.

3.1 Type of initiative

The type of initiative refers to the scope to which it extends and could give information about its durability over time. The information has been cataloged in: curricular initiative, series of initiatives, and single initiative.

As it is possible to observe from the graph 3.1, most of the universities under consideration carry out series of initiatives which are therefore composed of several actions and activities and have a longer duration over time. The only University of Auckland and University of Sydney (USYD) have the majority of single initiatives. Western Sydney University (WSU), La Trobe University, and RMIT on the other hand do not present single initiatives. University of Bologna (UniBo) and University of British Columbia (UBC), have almost all the actions related to series of initiatives,

57

Figure 3.1: Type of initiative summary graph

just a small number of single initiatives and no curricular initiative. Overall it is possible to state that initiatives that have an extension over time and are part of a larger program are the most used, as their implication has a greater impact.

3.2 Level of impact

Level of impact refers to the scale of impact that the initiative has, in terms of how it affects the internal/external environment. It has been divided into: university course level, university unit level, intra-university level, and territorial level.

From the graph 3.2, it is evident that all universities carry out initiatives that have an impact on the territory and are not limited to the university sphere. This is important because the main purpose of many universities is to do research to improve the current condition of the territory and of society, and to have relationships with actors outside the university to better train future generations. Intra-university collaboration between different departments, teams, or research groups within the same university can also be deduced. In the minority, on the other hand, the initiatives undertaken at the level of the course or university unit in almost all cases.
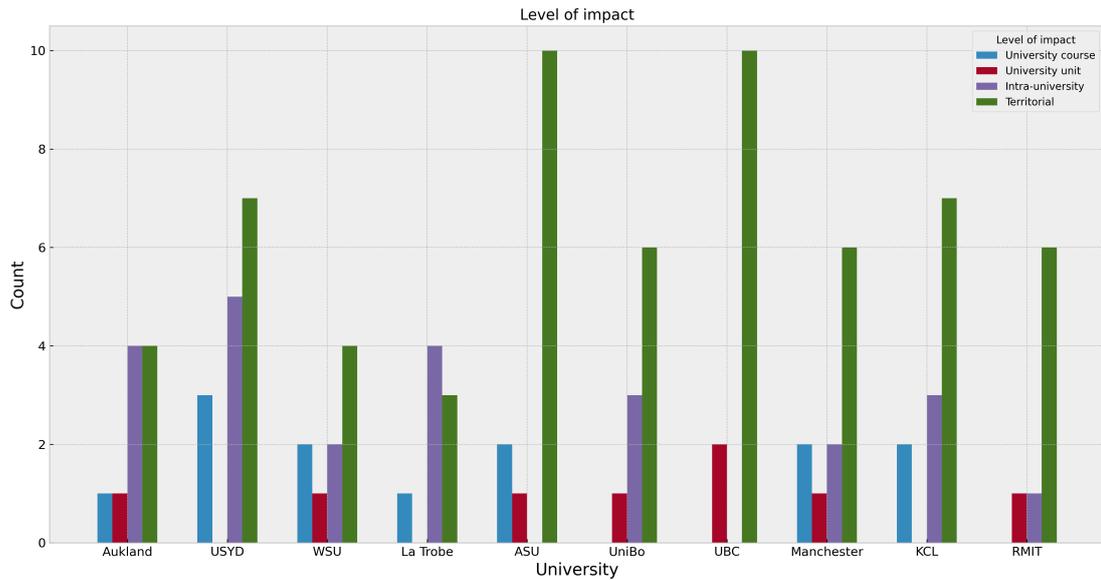
Figure 3.2: Level of impact summary graph

3.3 Pedagogical approach

The pedagogical approach refers to the broad principles and methods of education used in teaching practice. It is an educational decision made by the instructor to support student learning, engagement, and instructor-student, student-student, or student-content interactions. The chosen categories are: lectures, project-based approach, challenge-based approach, experiential learning, dissemination, and serious game.

According to the graph 3.3, it is possible to observe that in almost all the universities dissemination as a pedagogical approach far surpasses other approaches. Only in Arizona State University (ASU), dissemination is the least used; in University of British Columbia (UBC), is the second used after experiential learning; in University of Bologna (UniBo) and in the University of Manchester dissemination is at the same level of other approaches. It is evident that the classic teaching method of lectures, where instructors directly communicate curricular information to students, is increasingly supported by methods that require the active participation of students.
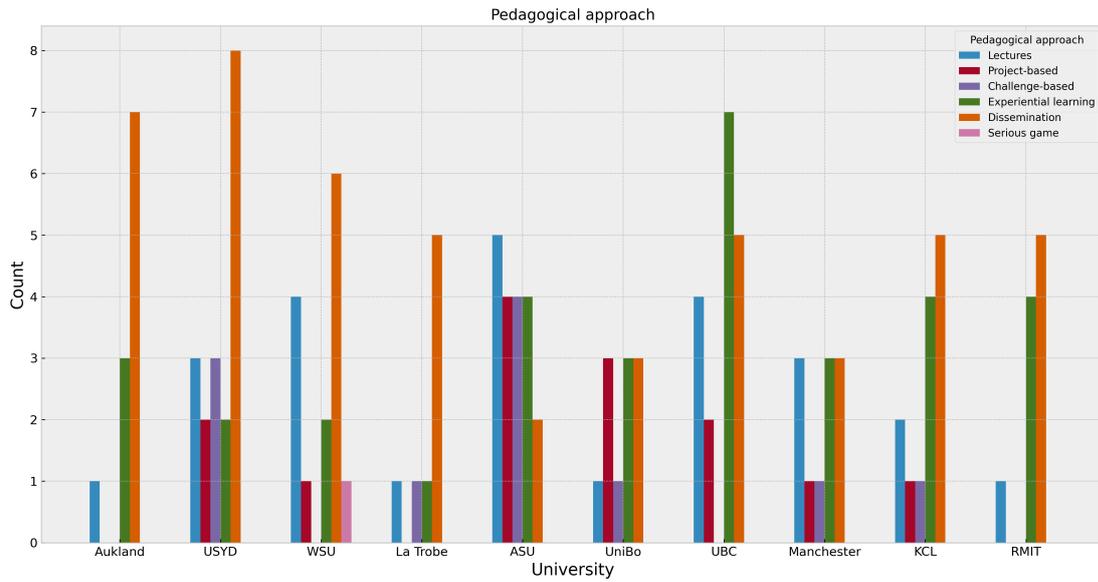
Figure 3.3: Pedagogical approach summary graph

3.4 Students involvement

Students involvement explains if the initiative requires the participation of students or if it does not concern them.

The graph 3.4 shows that all the universities under consideration carry out initiatives that also involve the participation of students, except for RMIT which has initiatives with and without students at the same level. The University of British Columbia only has initiatives with students. This is an important point, because only involving students in a more participatory way, could help training the most prepared future decision-makers.

3.5 Stakeholders involved

Stakeholders involved specify, if any, the type of external stakeholders involved in the initiative. They could be: non-governmental organizations (NGOs), governmental organizations (GOs), intergovernmental organizations (IGOs), non-profit organizations (NPOs), city councils, companies, and citizens associations.

From the graph 3.5, it is possible to observe that the stakeholders involved
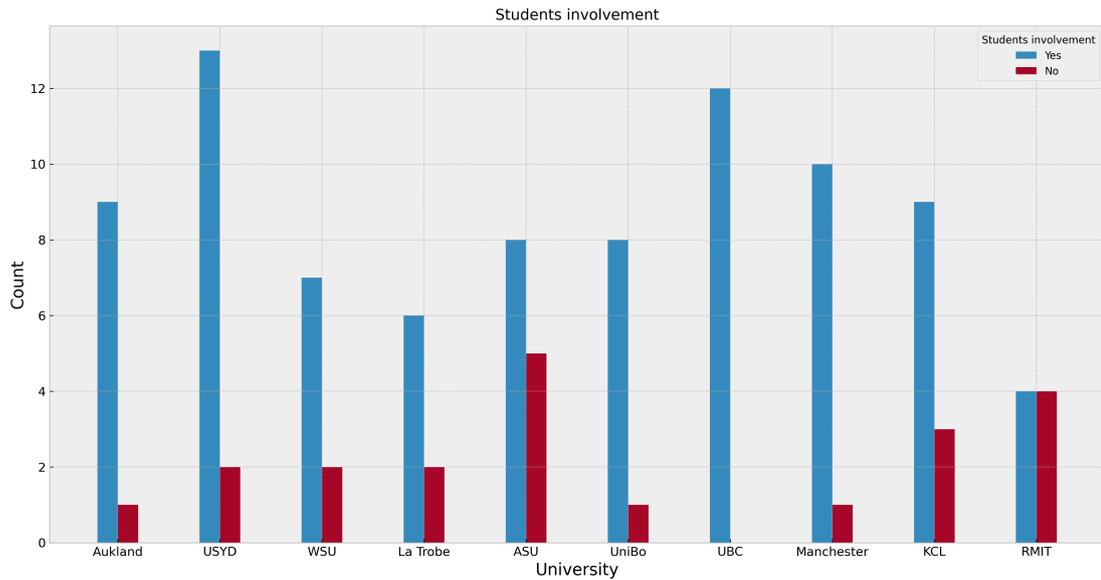
Figure 3.4: Students involvement summary graph

in the different universities do not follow a specific trend and are rather not homogeneous. At the University of British Columbia (UBC), the University of Manchester, and King's College of London (KCL), there is greater involvement with citizens associations. At the University of Bologna (UniBo) and Western Sydney University (WSU), city councils are more involved. University of Sydney, Arizona State University (ASU), and RMIT university engage respectively governmental organizations, non-profit organizations, and other universities.

3.6   Strategy

Strategy refers to the direction of the process for initiating and developing the activity. It could be mandatory/voluntary based or a competition.

The graph 3.6 demonstrates that mandatory-based initiatives are the most used, except the University of Aukland which has a majority of voluntary-based initiatives. Arizona State University (ASU) and the University of British Columbia (UBC) have the same number of mandatory-based and voluntary-based initiatives. Competitions are not a common strategy employed, in fact, only three out of ten universities have adopted it.
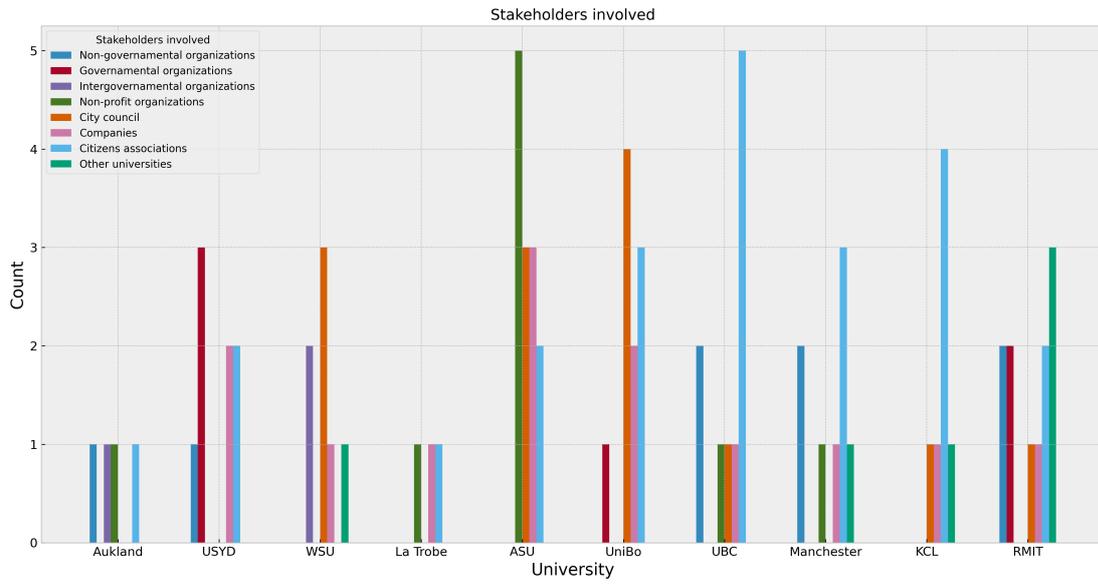
Figure 3.5: Stakeholders involved summary graph
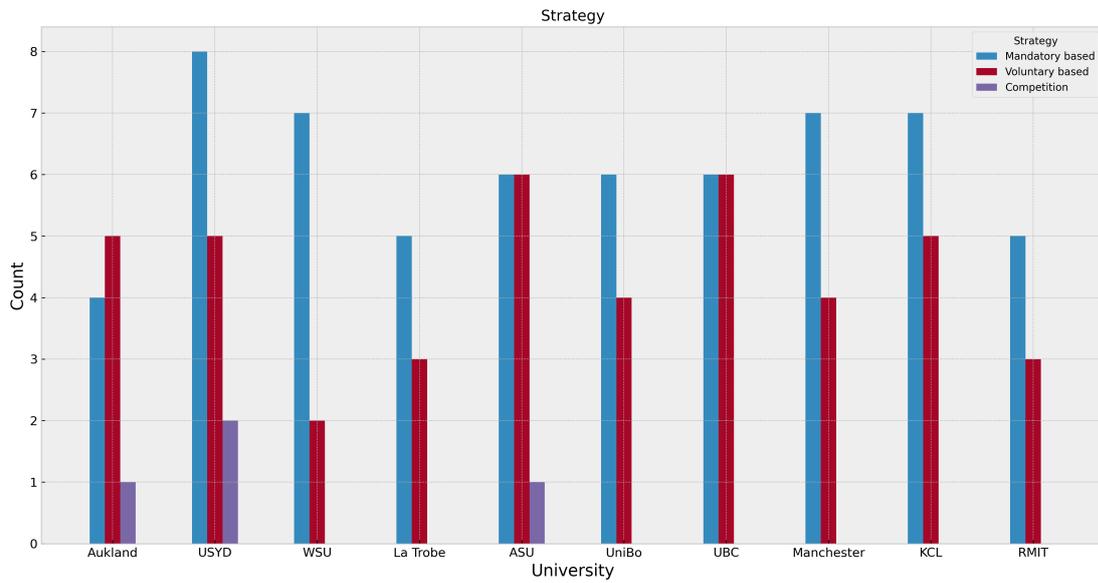
Figure 3.6: Strategy summary graph

62
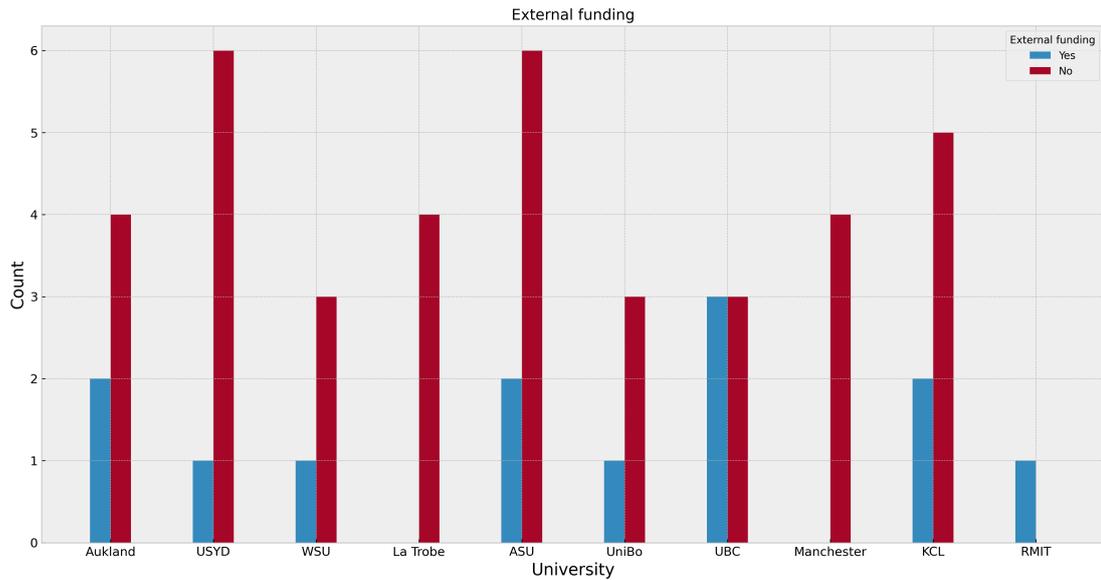
Figure 3.7: External funding summary graph

3.7 External funding

External funding describes if the initiative benefits other external funds in addition to those of the university.

Since most of the initiatives are related to the universities' courses and the kind of information is difficult to be found, the result is that most of them are not funded by external money, as it is possible to observe from the graph 3.7. The only University of British Columbia has the same number of funded and not funded initiatives. La Trobe University and the University of Manchester have information only regarding the unfinanced initiatives. On the contrary RMIT University has only information about the funded ones.

Chapter 4

Discussion and Conclusions

Universities have the significant role of implementing the Sustainable Development Goals (SDGs), in order to educate future generations about sustainability while having a positive impact on the territory. The society is facing urgent environmental and economic challenges, so different solutions are required. By using approaches that go beyond the conventional teaching methods, higher objectives can be achieved. Furthermore, it can be understood how they could be replicated in other Universities. The aim of this study was to explore the strategies and tactics of the top ten universities (according to THE rankings mentioned before) to achieve a better sustainability education, interdisciplinary research, and a more effective social impact at their local and global levels. Results are useful to detect the unmissable and more recurrent ingredients for the success of such research/education/third mission initiatives and strategies and to understand affecting factors as per the context in which they take place.

From the presented results it is possible to summarize some of the recurring characteristics among the various universities. Firstly, universities that have an impact on society carry out initiatives that extend beyond the university boundary (Figure 3.2). Secondly, the initiatives which last longer over time and are therefore not limited to a single event, are those that can have a greater impact (Figure 3.1). Moreover, pedagogical approaches other than traditional lessons are believed to be more effective for preparing future generations and for addressing current challenges. The most adopted ones are: dissemination (the university intent is to

spread knowledge, and information on the research and program results undertaken. According to the article [38], dissemination is a methodology for learning and teaching developments that must be adaptable and involve an array of stakeholders engaged in multiple domains, intersecting communities of practice that may be supportive or resistant), experiential learning (which is the process of learning through experience, and is more narrowly defined as "learning through reflection on doing" [37]), followed by project and challenge-based approaches (where students work in groups to solve challenging problems that are authentic, curriculum-based, and often interdisciplinary. Learners decide how to approach a problem and what activities to pursue. [35]) (Figure 3.3). Of great importance, there is also the relationship and the involvement with the external actors in the territory such as city councils, citizens associations, and companies (Figure 3.5). It emerged that the most effective approaches are top-down initiatives by universities (Figure 3.6) where students participation is certainly one of the main ingredients (Figure 3.4). External funds are not considered fundamental to carry on impacting initiatives (Figure 3.7).

Universities are getting closer to a new approach that opens the campus boundaries by expanding outwards and engaging with external partners. Introducing innovations in education activities merging education and engagement with external stakeholders can create a large common ground between education and the third mission.

Project-based and challenges from real-life learning and search solutions are widely used by many universities. The third mission becomes increasingly an integrated part of both the research and education missions. It was stressed how important it is to link theoretical learning with the solution of real-life problems for enabling students to become future innovators.

Research for impact, defined as the potential for the research to benefit society and contribute to the achievement of desired social outcomes by the US National Science Foundation, leads universities to have an active role. Traditionally, assessment of impact has focused too much only on academic impact. In reality, the impact is measured by indicators of change outside universities and research institutions in the real world. Be supported by public or private funds is one of

the key points but not the only one to maintain and improve the achievements of the HEI sector both in undertaking advanced research of the highest quality and building on research to achieve demonstrable benefits to the wider society. The dissemination of research results assumes a strategic role downstream of any activity related to research. Experimentation of good practices and innovation with the aim of connecting scientific research and civil society is the way to foster a deeper dialogue.

Since there are not standardized methodologies to understand HEIs contributions to the implementation of innovative actions for supporting the SDGs and to map their impact, universities are trying to engage in new approaches to have successful results. Having more standardized ways for impact mapping, allowing institutions to learn from these, can help to involve even more universities in having an active role in society sharing their results.

4.1   Constraints in the Italian context

Starting from the results of the best practices and from the Italian situation explained in the introduction section, it is possible to state that one of the main missing points, based on the proposed indicator by ANVUR, is absolutely the engagement with external stakeholders. The important collaboration between universities and other actors in the territory (NGOs, GOs, IGOs, city councils, etc.) was not considered by the Italian agency. Between the indicators, public engagement is considered as "the set of activities organized institutionally by the university or its non-profit structures with an educational, cultural and developmental value of the company and aimed at an audience of non-specialists.", putting a limitation on the understanding of the network in which universities are involved. Although, how it was possible to observe from the selected case studies, one of the central objectives for having an impact in society is to overcome the conception of a university closed within its own borders.

One aspect to be taken into consideration is that private universities are usually more incentivized to strengthen their image by involving more stakeholders in their activities. Since most of the Italian universities are public and there is not the culture of the private institution as especially in other Anglo-Saxon universities,

one important open question is how these public universities could engage more easily with external actors.

Even if it is possible to notice positive results in the last years, there are many reasons that can help to understand the delay in innovation in the university institutions in Italy compared to other countries. First of all, there is a cultural reason: especially in the past, the university has rarely been called to account for scientific research which, on the contrary, has always remained within the academic boundaries. Secondly, as emerged from the results (Figure 3.7) the problem is not the contribution of external funds but the bad fund's allocation. Italy is considered last in Europe for research and education funds, given by a non-selective allocation of public funds for better universities and only a small part of the funding is awarded on merit. According to the latest Anvur 2018 report, the amount allocated to research in Italy in 2018 was 1.32% of GDP, below the average of OECD countries and European countries, respectively at 2.36% and 1.95%. In a similar way, referring to the results of the RUS 2020 report, presented in the introduction of the thesis, the principal barriers that universities are facing to implement sustainable development actions is the lack of dedicated resources to manage the necessary inter and transdisciplinary approach coordinating education, research, and third mission impact through sustainability transition.

To overcome these limits there is not a clear and single solution. It is certainly necessary to strengthen the administrative machinery of universities to support teaching staff in scientific research at the national and international level, to provide attention to the emerging skills required by the Italian and local labor market to incentivize a targeted specialization of the training offer and really corresponding to the needs of the territory (enhance the involvement of stakeholders and the profile of contact with companies). In addition, it is important to create and aggregate networks of universities to promote internationalization (attract students and researchers to improve the quality of research and expand the potential number of students) on the basis of local and national specificities.

4.2   Future development

Future works may explore what other universities outside of THE rankings are doing to have a greater impact on the territory. It could be interesting to compare the results of universities belonging to and not belonging to the ranking, to verify if there are universities that are not interested in communicating the outcomes but are still actively engaged in addressing global problems having an impact. Having a greater number of sample cases could help to have a more complete overview of the actual situation.

Future developments could also engage in the proposal of new ways to measure and mapping the impact of universities in societies, encouraging them to be increasingly involved in the territory and to share the results.

It is in fact fundamental to remember that only through the awareness of the institutions' contribution and through a ever-increasing university involvement in the global challenges, will be possible to better cope with today's complex problems.

Appendix A

Initiatives' websites links

A.1 University of Auckland

A.1.1 Social impact

- Research impact competition: `https://www.auckland.ac.nz/en/business/our-research/research-impact-competition.html`

- Research Communication, Influence, and impact: `https://www.auckland.ac.nz/en/students/academic-information/postgraduate-students/doctoral-development-framework/Comms-influence-impact.html`

- Campaign for all our futures: `https://www.auckland.ac.nz/en/giving/about-the-campaign.html`

A.1.2 Service learning

- Volunteer Impact Week: `https://www.auckland.ac.nz/en/alumni/get-involved/volunteer-impact-week.html`

A.1.3 Sustainability education

- University of Auckland Annual Report: `https://www.auckland.ac.nz/en/about-us/about-the-university/the-university/official-publications/annual-report.html`

- Studying sustainability: `https://www.auckland.ac.nz/en/about-us/about-the-university/the-university/sustainability-and-environment/studying-sustainability.html`

- Sustainability-Take action!: `https://www.auckland.ac.nz/en/about-us/about-the-university/the-university/sustainability-and-environment/take-action.html`

- SDG 4 Hub: `https://www.auckland.ac.nz/en/about-us/about-the-university/the-university/sustainability-and-environment/sdg-4-hub.html`

A.1.4 Climate emergency

- Ingenio Spring 2020: `https://www.auckland.ac.nz/en/alumni/whats-happening/alumni-publications/ingenio.html`

- Annual Report (climate action section): `https://www.auckland.ac.nz/en/about-us/about-the-university/the-university/official-publications/annual-report.html`

A.2 University of Sydney

A.2.1 Social impact

- The social Impact Scholarship (MBA): `https://www.sydney.edu.au/scholarships/a/social-impact-scholarship.html`

- Connect for: A better future program: `https://www.sydney.edu.au/engage/events-sponsorships/connect-for-festival.html`

- Research with impact: `https://www.sydney.edu.au/research/research-impact.html`

- TEDx Sydney: `https://www.sydney.edu.au/engage/events-sponsorships/tedx-sydney.html`

A.2.2 Service learning

- Service learning in indigenous communities: `https://www.sydney.edu.au/students/service-learning-in-indigenous-communities.html`

A.2.3 Sustainability education

- Courses in sustainability: `https://www.sydney.edu.au/courses/search.html?keywords=sustainability&search-type=course&page=1`

- Industry and community projects program: `https://www.sydney.edu.au/students/industry-and-community-projects.html`

- Open Learning environment: `https://www.sydney.edu.au/students/explore-open-learning-environment.html`

- Sustainability strategy 2020: `https://www.sydney.edu.au/content/dam/corporate/documents/about-us/values-and-visions/sustainability/sustainability_strategy_2020.pdf`

A.3 Western Sydney University

A.3.1 Social impact

- Research with impact: `https://www.westernsydney.edu.au/ics/partner_with_ics/impact`

A.3.2 Sustainability education

- RCE Greater Western Sydney: `https://www.westernsydney.edu.au/rcegws/rcegws/About`

- CORE framework-Sustainability education: `https://www.westernsydney.edu.au/learning_futures/home/sustainability_education`

- Sustainability programs at western: `https://www.westernsydney.edu.au/learning_futures/home/sustainability_education/curriculum/learning_and_teaching`

- UNAI World Hub SDG 10: `https://www.westernsydney.edu.au/learnin g_futures/home/sustainability_education/engagement/unai_hub`

A.3.3 Climate emergency

- Climate action program: `https://www.westernsydney.edu.au/learning_f utures/home/sustainability_education/research/climate_action`

- Action plan-Resilience & Climate Change: `https://www.westernsydney.ed u.au/environmental_sustainability/home/action_plan/Resilience_C limate`

A.3.4 Challenge-based learning

- Problem based learning: `https://lf.westernsydney.edu.au/engage/the ory/problem-based-learning#toc-anchor-4`

- RefQuest: `https://refquest.westernsydney.edu.au/`

A.4 La Trobe University

A.4.1 Social impact

- Research impact at La Trobe: `https://www.latrobe.edu.au/research/re search-impacts`

A.4.2 Service learning

- Service learning in the community: `https://www.latrobe.edu.au/stude nts/opportunities/wil-placements/elective-placements/service-l earning-in-the-community`

A.4.3 Sustainability education

- Courses in sustainability: `https://www.latrobe.edu.au/sustainability/ education`

- Green impact project: `https://www.greenimpact.org.uk/latrobe`

- Future ready strategy: `https://www.latrobe.edu.au/sustainability/practices`

A.4.4 Climate emergency

- La Trobe climate network: `https://www.latrobe.edu.au/sustainability/climate-network`

- Net zero project: `https://www.latrobe.edu.au/sustainability/net-zero/our-projects`

A.4.5 Challenge-based learning

- Industry innovation challenge: `https://www.latrobe.edu.au/students/your-course/subjects/current/she3inc-industry-innovation-challenge`

A.5 Arizona State University

A.5.1 Social impact

- Social impact measurement & management: `https://lodestar.asu.edu/content/social-impact-measurement-management`

- Social impact measurement certificate: `https://lodestar.asu.edu/content/social-impact-measurement-certificate`

- Interdisciplinary solutions for social impact: `https://graduate.asu.edu/interdisciplinary-solutions-social-impact-workshop-impacting-inequality-labs`

A.5.2 Service learning

- ASU University service learning: `https://communityengagement.education.asu.edu/programs/university-service-learning`

- Ariziona service enterprise initiative: `https://lodestar.asu.edu/content/arizona-service-enterprise-initiative`

A.5.3 Sustainability education

- ASU sustainability education: `https://sustainability-innovation.asu.edu/education/asu-sustainability-education/`

- Sustainability connect collaboration: `https://sustainabilityconnect.asu.edu/`

- Rob and Melani Walton sustainability solutions: `https://sustainability-innovation.asu.edu/sustainabilitysolutions/programs/global-studies/`

- Julie Ann Wrigley global futures laboratory: `https://sustainability-innovation.asu.edu/sustainabilitysolutions/programs/global-studies/`

- Global institute of sustainability and innovation: `https://sustainability-innovation.asu.edu/`

- ASU project cities: `https://sustainability-innovation.asu.edu/project-cities/`

A.5.4 Climate emergency

- Urban climate research center `https://sustainability-innovation.asu.edu/urban-climate/research/`

A.5.5 Challenge-based learning

- The challenge 2020 `https://outreach.engineering.asu.edu/challenge2020/`

A.6 University of Bologna

A.6.1 Social impact

- Third mission program: `https://www.unibo.it/it/terza-missione`

- AlmaEngage: `https://site.unibo.it/almaengage/it/chi-siamo`

A.6.2 Service learning

- Service learning and community engagement lab: `https://www.unibo.it/it/didattica/insegnamenti/insegnamento/2020/448615`

A.6.3 Sustainability education

- Multicampus sostenibile: `https://site.unibo.it/multicampus-sostenibile/it/chi-siamo`

- Green Office: `https://site.unibo.it/multicampus-sostenibile/it/green-office`

- AlmaGoals: `https://site.unibo.it/almagoals/en`

- Foundation for urban innovation - FIU: `https://www.fondazioneinnovazioneurbana.it/fondazione-innovazione-urbana-home`

A.6.4 Climate emergency

- AlmaGoals climate action: `https://site.unibo.it/almagoals/en/goals/13-climate-action`

A.6.5 Challenge-based learning

- IDEA `https://site.unibo.it/idea/it/la-nostra-idea/attivita-e-iniziative/cbi-challenge-based-innovation`

A.7 University of British Columbia

A.7.1 Social impact

- UBC Social Impact Fund: `https://innovation.ubc.ca/how-engage/entrepreneurship/ubc-social-impact-fund`

- Centre for Social Innovation & Impact Investing (UBC Sauder): `https://www.sauder.ubc.ca/thought-leadership/research-outreach-centres/centre-social-innovation-impact-investing`

A.7.2 Service learning

- Community Service-Learning Program (CSL): `https://students.ok.ubc.ca/career-experience/get-experience/community-service-learning/`

- Volunteering opportunities Program: `https://students.ok.ubc.ca/involvement-activities/volunteer-opportunities/`

- Be the Change Earth Alliance (BTCEA): `https://www.bethechangeearthalliance.org/climate_ambassador_workshops`

- Students Group Initiative: `https://sustain.ubc.ca/get-involved/student-groups`

A.7.3 Sustainability education

- EFS in Action: `https://efs.edst.educ.ubc.ca/efs-in-action/`

- Institute for Resources, Environment and Sustainability: `http://ires.ubc.ca/`

- UBC Sustainability Initiative: `https://sustain.ubc.ca/about`

A.7.4 Climate emergency

- UBC climate emergency engagement: `https://climateemergency.ubc.ca/`

- UBC Climate Hub: `https://ubcclimatehub.ca/uncategorized/second-annual-report-2019-2020/`

- Climate Action Plan: `https://sustain.ubc.ca/campus/climate-action/climate-action-plan`

A.8 University of Manchester

A.8.1 Social impact

- Social responsibility strategic plan: `http://www.socialresponsibility.manchester.ac.uk/about/`

- 10,000 Actions initiative: `http://www.sustainability.manchester.ac.uk/get-involved/staff/10000actions/`

A.8.2 Service learning

- Students' Union Volunteers: `http://www.volunteers.manchester.ac.uk/`

- Volunteer Hub: `https://find-volunteering.manchester.ac.uk/`

A.8.3 Sustainability education

- School of Environment, Education and Development: `https://www.seed.manchester.ac.uk/`

- Teaching and learning initiatives: `http://www.sustainability.manchester.ac.uk/teaching/`

- Environmental Sustainability strategy: `http://www.sustainability.manchester.ac.uk/`

- Sustainability Challenge: `http://www.sdce.manchester.ac.uk/egc/sustainability-challenge/#anchor`

A.8.4 Climate emergency

- Tyndall Manchester: `https://www.tyndall.manchester.ac.uk/`

- Climate Change and Society unit course: `http://www.college.manchester.ac.uk/units/?year=2020&semester=1&course=341`

- Applied Sustainability: `https://documents.manchester.ac.uk/display.aspx?DocID=36199`

A.9 King's College London

A.9.1 Social impact

- Research & Innovation creating impact: `https://www.kcl.ac.uk/research/support/creating-impact`

- Making sense of the impact on society: `https://www.kcl.ac.uk/society-research`

- SERVE-Service Annual Report: `https://kings-college-london.foleon.com/starting-point/service-annual-report-2019-20/home/`

A.9.2 Service learning

- King's Volunteering: `https://www.kcl.ac.uk/service/service-in-action`

A.9.3 Sustainability education

- Sustainability-Research and Education: `https://www.kcl.ac.uk/aboutkings/strategy/sustainability/research-education/research-education`

- Environmental Science for Sustainability MSc: `https://www.kcl.ac.uk/study/postgraduate/taught-courses/environmental-science-for-sustainability`

- KCL Sustainability: `https://blogs.kcl.ac.uk/sustainability/whats-on/get-involved/`

- Extracurricular Opportunities-Sustainability: `https://www.kcl.ac.uk/opportunities/sustainability`

A.9.4 Climate emergency

- King's Climate Action Network: `https://www.kcl.ac.uk/aboutkings/strategy/sustainability/policies-strategies/carbon/kings-climate-action-network`

- King's Climate Hub: `https://www.kcl.ac.uk/research/kings-climate`

A.9.5 Challenge-based learning

- Active learning at King's: `https://blogs.kcl.ac.uk/activelearning/2019/08/09/problem-based-learning/`

- King's Civic Challenge: `https://www.kcl.ac.uk/london/kingslocal/civic-challenge`

A.10 RMIT University

A.10.1 Social impact

- RMIT Social Innovation Hub: `https://www.rmit.edu.au/about/governance-management/structure/policy-strategy-impact/social-innovation-hub`

- Social change research: `https://www.rmit.edu.au/research/our-research/enabling-capability-platforms/social-change`

- RMIT Social and Global Studies Centre: `https://www.rmit.edu.au/about/schools-colleges/global-urban-and-social-studies/research/research-centres-and-groups/social-global-studies-centre`

A.10.2   Service learning

- Volunteer at RMIT: `https://www.rmit.edu.au/students/work-study-opportunities/volunteering`

- RMIT University Student Union: `https://www.rusu.rmit.edu.au/membership`

A.10.3   Sustainability education

- RUSU-Sustainability department: `https://rusu.rmit.edu.au/sustainability`

- RMIT-Sustainability: `https://www.rmit.edu.au/about/our-values/sustainability`

A.10.4   Climate emergency

- Research Project Climate Action: `https://www.rmit.edu.au/about/our-values/sustainable-development-goals/goal-13`

Bibliography

[1] United Nations General Assembly. *Transforming our world: the 2030 Agenda for Sustainable Development.* `https://undocs.org/A/RES/70/1`. Oct. 2015 (cit. on pp. 1, 2).

[2] International Council for Science. *Strengthening International Science For The Benefit Of Society.* `https://council.science/wp-content/uploads/2018/06/ICSU_annual_report_2017_screen.pdf`. Annual report. 2017 (cit. on p. 2).

[3] Wendy Maria Purcell, Heather Henriksen, and John D Spengler. «Universities as the engine of transformational sustainability toward delivering the sustainable development goals:"Living labs" for sustainability». In: *International Journal of Sustainability in Higher Education* (2019) (cit. on p. 2).

[4] United Nations Office for Disaster Risk Reduction. *Sendai Framework for Disaster Risk Reduction 2015-2030.* `https://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf`. Report. 2015 (cit. on p. 3).

[5] William Colglazier. «Sustainable development agenda: 2030». In: *Science* 349.6252 (2015), pp. 1048–1050 (cit. on p. 5).

[6] World Economic Forum. *The Global RisksReport 2020.* `http://www3.weforum.org/docs/WEF_Global_Risk_Report_2020.pdf`. Report. 2020 (cit. on p. 5).

[7] IPCC. *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response*

to the threat of climate change, sustainable development, and efforts to erad-icate poverty. https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res.pdf. Report. 2018 (cit. on p. 5).

[8] Thomas Jahn, Matthias Bergmann, and Florian Keil. «Transdisciplinarity: Between mainstreaming and marginalization». In: *Ecological Economics* 79 (2012), pp. 1–10 (cit. on p. 7).

[9] Basarab Nicolescu. «Methodology of transdisciplinarity». In: *World Futures* 70.3-4 (2014), pp. 186–199 (cit. on p. 8).

[10] Rick Szostak. «Interdisciplinarity: resources abound». In: *Nature* 526.7574 (2015), pp. 506–506 (cit. on p. 8).

[11] Roland W Scholz. «Transdisciplinarity: science for and with society in light of the university's roles and functions». In: *Sustainability science* 15.4 (2020), pp. 1033–1049 (cit. on p. 8).

[12] J Thompson Klein, Walter Grossenbacher-Mansuy, Rudolf Häberli, Alain Bill, Roland W Scholz, and Myrtha Welti. *Transdisciplinarity: joint problem solving among science, technology, and society: an effective way for managing complexity.* Springer Science & Business Media, 2001 (cit. on p. 8).

[13] Henry Etzkowitz, Andrew Webster, Christiane Gebhardt, and Branca Regina Cantisano Terra. «The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm». In: *Research policy* 29.2 (2000), pp. 313–330 (cit. on p. 9).

[14] Arend Zomer and Paul Benneworth. «The rise of the university's third mission». In: *Reform of higher education in Europe.* Brill Sense, 2011, pp. 81–101 (cit. on p. 9).

[15] Paul Benneworth. *Universities and regional economic development: Engaging with the periphery.* Routledge, 2018 (cit. on p. 9).

[16] Hendrik Berghaeuser and Michael Hoelscher. «Reinventing the third mission of higher education in Germany: Political frameworks and universities' reactions». In: *Tertiary Education and Management* 26.1 (2020), pp. 57–76 (cit. on p. 9).

[17] Philippe Laredo. «Revisiting the third mission of universities: Toward a renewed categorization of university activities?» In: *Higher education policy* 20.4 (2007), pp. 441–456 (cit. on p. 9).

[18] Fadi El-Jardali, Nour Ataya, and Racha Fadlallah. «Changing roles of universities in the era of SDGs: rising up to the global challenge through institutionalising partnerships with governments and communities». In: *Health research policy and systems* 16.1 (2018), pp. 1–5 (cit. on p. 10).

[19] Walter Leal Filho et al. «Sustainable development policies as indicators and pre-conditions for sustainability efforts at universities». In: *International Journal of Sustainability in Higher Education* (2018) (cit. on pp. 11, 22).

[20] Giulia Sonetti, Caterina Barioglio, and Daniele Campobenedetto. «Education for Sustainability in Practice: A Review of Current Strategies within Italian Universities». In: *Sustainability* 12.13 (2020), p. 5246 (cit. on p. 11).

[21] Walter Leal Filho et al. «Sustainable Development Goals and sustainability teaching at universities: Falling behind or getting ahead of the pack?» In: *Journal of Cleaner Production* 232 (2019), pp. 285–294 (cit. on p. 11).

[22] Giuseppe Novelli and Maurizio Talamo. «La Terza Missione per l'Università Italiana». In: *Una nuova occasione per crescere* (), pp. 2739–2746 (cit. on p. 15).

[23] Carlo Carboni and Francesco Orazi. «The third university mission in Italy: Potentialities and criticalities». In: *International Journal of Business and Social Science* 7.10 (2016), pp. 23–34 (cit. on p. 15).

[24] M Binotto and S Nobile. «Università italiana e Terza missione». In: *Morcellini M., Rossi P., Valentini E., a cura di, Unibook. Per un database sull'Università. Milano: FrancoAngeli* (2017) (cit. on p. 16).

[25] Maria Cassella. «La Terza missione dell'università: cos' è, come si valuta (con un'appendice sulle biblioteche)». In: *Biblioteche oggi trends* 3.2 (2017), pp. 59–68 (cit. on p. 17).

[26] Lucas Veiga Ávila, Walter Leal Filho, Luciana Brandli, Colin J Macgregor, Petra Molthan-Hill, Pinar Gökçin Özuyar, and Rodrigo Martins Moreira. «Barriers to innovation and sustainability at universities around the world». In: *Journal of cleaner production* 164 (2017), pp. 1268–1278 (cit. on p. 21).

[27] Kimberly Coleman, James Murdoch, Shelly Rayback, Amy Seidl, and Kimberly Wallin. «Students' understanding of sustainability and climate change across linked service-learning courses». In: *Journal of Geoscience Education* 65.2 (2017), pp. 158–167 (cit. on p. 22).

[28] Barbara Jacoby et al. *Service-Learning in Higher Education: Concepts and Practices. The Jossey-Bass Higher and Adult Education Series.* ERIC, 1996 (cit. on pp. 22, 26).

[29] May Portuguez Castro and Marcela Georgina Gomez Zermeno. «Challenge based learning: Innovative pedagogy for sustainability through e-learning in higher education». In: *Sustainability* 12.10 (2020), p. 4063 (cit. on p. 22).

[30] Armando Lozano-Rodriguez, Fernanda Inez Garcia-Vazquez, Claudia Zubieta-Ramirez, and Claudia Susana Lopez-Cruz. «Competencies associated with Semestre i and its relationship to academic performance: A case study». In: *Higher Education, Skills and Work-Based Learning* (2019) (cit. on pp. 22, 26).

[31] Philipp Mayring. «Qualitative content analysis». In: *A companion to qualitative research* 1.2 (2004), pp. 159–176 (cit. on p. 25).

[32] Matthew B Miles and A Michael Huberman. *Qualitative data analysis: An expanded sourcebook.* sage, 1994 (cit. on p. 25).

[33] David R Thomas. «A general inductive approach for analyzing qualitative evaluation data». In: *American journal of evaluation* 27.2 (2006), pp. 237–246 (cit. on p. 42).

[34] Robin Kay, Thom MacDonald, and Maurice DiGiuseppe. «A comparison of lecture-based, active, and flipped classroom teaching approaches in higher education». In: *Journal of Computing in Higher Education* 31.3 (2019), pp. 449–471 (cit. on p. 44).

[35] Gwen Solomon. «Project-based learning: A primer». In: *Technology and learning-dayton-* 23.6 (2003), pp. 20–20 (cit. on pp. 44, 66).

[36]   Laurence F Johnson, Rachel S Smith, J Troy Smythe, and Rachel K Varon. *Challenge-based learning: An approach for our time.* Tech. rep. The new Media consortium, 2009 (cit. on p. 44).

[37]   Patrick Felicia. *Handbook of research on improving learning and motivation through educational games: Multidisciplinary approaches: Multidisciplinary approaches.* iGi Global, 2011 (cit. on pp. 44, 66).

[38]   Lesley Treleaven, Chris Sykes, and Jarrod Ormiston. «A dissemination methodology for learning and teaching developments through engaging and embedding». In: *Studies in Higher Education* 37.6 (2012), pp. 747–767 (cit. on pp. 44, 66).

[39]   Francesco Bellotti, Michela Ott, Sylvester Arnab, Riccardo Berta, Sara de Freitas, Kristian Kiili, and Alessandro De Gloria. «Designing serious games for education: from pedagogical principles to game mechanisms». In: *Proceedings of the 5th European Conference on Games Based Learning.* University of Athens Greece. 2011, pp. 26–34 (cit. on p. 44).