2nd GUNi International Conference on SDGs:
Higher Education & Science Take Action
Summary Report
Credits
2nd GUNi International Conference on SDGs: Higher Education & Science Take Action.

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Foreword
Dear colleagues,

As we all know, our societies are undergoing major environmental, political, economic and cultural changes that have deep implications for the present and future of higher education, its nature and its social responsibilities. We cannot deny these changes. Instead, we need to take action, embrace necessary transformation and become more resilient and flexible, while always taking into account that higher education institutions are contributors to the public good.

Most importantly, it is evident now more than ever that we are inevitably connected to one another at many levels and that we must rely on collaboration, cooperation and partnerships to solve the various challenges that we are now and may soon be facing, both at the local and global levels. The crisis stemming from the Covid-19 pandemic demands that we rethink higher education, its mission and values, and its role in relation to the public good and social responsibility. GUNi, as a laboratory of ideas, has a crucial role to play in promoting analysis and debate on higher education policies and management for the benefit of societies.

Because higher education institutions are drivers of change through teaching, research, transfer and community engagement, it is undeniable that we have a key part to play in improving our societies, our lives and our planet. The 2030 Agenda, together with its 17 Sustainable Development Goals, has given us the chance to rethink the way we work and has inspired many students, professors, researchers and practitioners around the world to want to make a difference. The 2030 Agenda, together with its 17 Sustainable Development Goals, has given us the chance to rethink the way we work and has inspired many students, professors, researchers and practitioners around the world to want to make a difference.

The 2nd GUNi International Conference on the Sustainable Development Goals, entitled “2nd GUNi International Conference on SDGs: Higher Education & Science Take Action. Summary Report.”, was an international meeting place for 230 delegates from nearly 30 countries around the world (South Africa, India, Canada, Colombia, Sweden, Mexico, Italy, the United States, France, Norway, Sudan, Andorra, Chile, Belgium, Argentina, Belarus, Egypt, the United Kingdom, Russia, Portugal, Romania, Venezuela, Taiwan, Slovenia, Cameroon, Austria, Bolivia, Croatia, Ecuador, Denmark, Ireland, Kenya, Hungary, Morocco, the Netherlands, Spain, Poland, Serbia, Oman, Paraguay, France, Finland, Japan, Germany and more), who presented and discussed bold ideas for action, innovative research strategies, and creative projects and programmes being carried out in different regions of the world at both the local and global levels. As you know, GUNi is itself an open space to meet, debate, discuss, cooperate, collaborate and learn, and the wonderful thing about GUNi is the international perspective that our members bring to these encounters.

The Conference gave us an opportunity to discuss current issues and engage in lively debates in which we exchanged our views. It was especially interesting to learn about initiatives and developments from local, regional and international perspectives. During the Conference, we talked about the importance of networks, institutional strategies and initiatives. We looked at the role that our youth are playing in order to learn from them because they are our future. We discussed teacher training, key competences, climate change adaptation and mitigation, and service learning. And most importantly, we talked about all of these issues with an eye toward gender and human rights.

The report that you have in your hands or on your screens is a compilation of articles that describe the projects and initiatives presented at the Conference. It is a testament to the collaborative work and effort undertaken by professors, researchers, practitioners and students from all over the world. The report is a complete summary of the Conference, but it is also a tribute to our engaged colleagues who are striving to take action and make a change. I am confident that you will find it both interesting and useful.

In closing, I would like to take this opportunity once again to thank everyone who made the Conference possible. We are very grateful for the tremendous support of all our sponsors: the Catalan Agency for Development Cooperation, the Department of Foreign Affairs and the Universities and Research Secretariat of the Government of Catalonia. I would also like to express my gratitude to Universitat Pompeu Fabra (UPF) for hosting the Conference and to UNESCO for their unerring support. Lastly, I would like to give my thanks to the whole GUNi Team, whose members put together an engaging Conference programme and have edited this timely report.

María José Figueras
President, GUNi & Catalan Association of Public Universities Rector, Universitat Rovira i Virgili
Preface
Even before the pandemic outbreak, there was great global concern about the rate of progress towards the Sustainable Development Goals (SDG), which is clearly too slow. From the outset, higher education institutions, and particularly universities, have been called to play a preeminent role in achieving the goals. Precisely for this reason, many people consider that higher education institutions’ leading role in the area of sustainability, through training, research and outreach, is in crisis. Part of the cause can be found in the increasing pressure on higher education worldwide: institutions must do more with less. Added to this pressure is the need to act sustainably and catalytically to have a social and economic impact on the gradual progress towards a model of development in line with the SDGs.

Many high-quality studies have been undertaken on higher education institutions’ contribution to the SDGs. Generally, they are comparative, survey-based or case studies that describe institutional experiences. Most conclude with recommendations that demand even more from higher education institutions. This is because higher education institutions are considered living laboratories in the area of sustainable development, and their activities can have a multiplier effect in the field that probably no other institution, with the exception of schools, can have. Furthermore, recommendations often ask universities to play a more prominent role, as if this were merely a question of choice.

The publication should be read considering this context as a point of reference. Its main aim, which is fully aligned with the work of GUNi, is to promote an increase in the number of higher education institutions that are committed to the SDGs. This is particularly important in developing countries, where conditions for implementing this commitment can make it a difficult ambition to achieve.

Indeed, higher education institutions could lead the process of transforming activities to reduce negative impacts on the environment and ensure the adoption of a sustainable development model. Most higher education institutions are as big as small or medium-sized towns. They form real communities whose practices can set an example for other communities, from small towns to big cities.

In this regard, a review of international debates and practices reveals the emergence of three key factors that often work simultaneously. The first, and probably the most important, is the design of an institutional strategic plan for sustainability that is focused on some immediate priority objectives but can also guide daily practices and future developments. The second is the gradual transformation of institutional practices in areas that are crucial for sustainability, including the design and maintenance of buildings and waste treatment. The third consists of generating awareness-raising campaigns that transmit clear messages to members of the academic community, to gradually change behaviour and increase awareness of the need to make a daily commitment to sustainable development. In many cases, awareness-raising campaigns are an integral part of strategic plans. Clearly, it is not easy to incorporate sustainability into higher education and its implementation is irregular, to say the least, in terms of what is understood by sustainability and its introduction in all disciplines. The culture of sustainability is translated into members of an organization having budgets and shared beliefs on the importance of balancing economic efficiency, social equity and environmental responsibility. The fact that sustainability has not been incorporated into higher education institutions suggests that it has not yet become a part of mainstream institutional culture.

This observation is supported by UNESCO’s call to integrate the values inherent in sustainable development into all aspects of learning, particularly given that most obstacles to sustainability are human rather than technical. If higher education institutions are to fulfil their potential role as exemplary organizations, as technical, cognitive and cultural models of sustainability for their students and for the community they serve, then they must be prepared to promote change and significant cultural transformation from within. This requires a shift in attitude and the development of a new set of values and behaviour, that is, an organizational culture for sustainability. The good news is that this change is already happening, as shown by the many examples from around the world in this publication. It is more than welcome.

Francesc Pedró
Director, UNESCO-IESALC
GUNi Taking Action for the 2030 Agenda
As many readers of this report will already know, the Global University Network for Innovation (GUNi) is an international network created in 1999 by UNESCO, the United Nations University and the Universitat Politècnica de Catalunya–BarcelonaTech (UPC) in the wake of UNESCO's first World Conference on Higher Education. Since 2014, the Catalan Association of Public Universities (in Catalan, ACUP) has hosted the network's secretariat and presidency. GUNi now has 249 members from 80 countries, including the UNESCO Chairs on higher education, higher education institutions, research centres, and networks related to innovation and the social commitment of higher education. While GUNi's headquarters are located in Barcelona, it also has regional offices in the Asia-Pacific, Latin America and the Caribbean, and Africa. GUNi's founding mission remains fully in force (and is perhaps more necessary now than ever): namely to strengthen the role of higher education in society, and help to renew its goals and policies worldwide from the standpoint of public service, relevance and social responsibility.

In 2015, the United Nations and the international community adopted the 2030 Agenda and seventeen Sustainable Development Goals (SDGs) as a global call to action in defence of the environment, peace and justice. In response, GUNi set up a parallel line of strategic action focused on sustainable development, knowledge, research and partnerships. Under this strategy, GUNi's most important actions include:

- The organization and holding of the International Conferences on Sustainable Development Goals. The first conference, entitled "Actors and Implementation", took place in September 2017 at the UPC. Multidisciplinary experts, students and high-level practitioners from around the world came together to exchange knowledge, ideas, experiences and expectations in relation to the challenges posed by the SDGs. A second conference followed in March 2020 at Pompeu Fabra University (UPF) and this report is a collection of its main inputs and results.

- The establishment of the GUNi Group of Experts on SDGs and Higher Education, which is made up of representatives of some of the leading networks engaged in sustainable development and higher education. The group was created to offer a platform for debate, collaboration and the sharing of expertise among different regions, cultures and perspectives from around the world in order to drive forward the 2030 Agenda. The members of the group are:
  - Ghada Ahmedin (Arab Network for Environment and Development, RAED)
  - Carme Gual (Catalan Agency for Development Cooperation, ACCD)
  - Thomas Jørgensen (European University Association, EUA)
  - Akpazi Ogbuigwe (Earth Charter, United Nations University–Regional Centres of Expertise, UNU–RCEs)
  - Arnau Queralt (European Environment and Sustainable Development Advisory Councils, EEAC)
  - Charles W. Richardson (Association for the Advancement of Sustainability in Higher Education, AASHE & College of Business, Misericordia University)
  - Orlando Sáenz (Alliance of Ibero-American University Networks for Sustainability and the Environment, ARIUSA)
  - Rajesh Tandon (Participatory Research in Asia, PRIA & UNESCO Co-Chair in Community Based Research)

These members have played a key role in the second conference and served as the programme's advisory board.

- Edition and publication of reports. Thus far, GUNi has published four reports on the SDGs, all of which are available for download on the GUNi website:
  - Sustainable Development Goals: Actors and Implementation. A Report from the International Conference
  - Approaches to SDG17: Partnerships for the Sustainable Development Goals
  - Implementing the 2030 Agenda at Higher Education Institutions: Challenges and Responses
At the time of the present report’s publication, it is evident that the Covid-19 pandemic poses an enormous stumbling block for our efforts to achieve the 2030 Agenda, the 17 Sustainable Development Goals and their targets. Given that progress was already slow before the pandemic and that the pandemic’s effects on our everyday lives, our healthcare systems, our education, our economy and our previously unquestioned interconnectedness have been harsh, there is no denying now that the achievement of the 2030 Agenda will not be a reality.

Indeed, the United Nations has already confirmed that the SDGs will not be met by 2030, because “the coronavirus pandemic has put the Sustainable Development Goals (SDGs) out of reach” (Editorial in Nature, July 2020).

Before the pandemic, we here at GUNi had already stated in reports and public presentations that in all likelihood the SDGs would not be met by 2030, or that they would only be met partially. We also believed, however, that they laid out an excellent roadmap, an excellent guide and plan for all countries, institutions and actors to work towards a common, shared future.

Although the pandemic will make our work much more difficult, it will also give us a chance to be critical of our systems and make much needed transformations at a variety of levels. As the editorial in Nature goes on to say, “it [the pandemic] shows that radical action can be taken to tackle poverty and inequality, health, education, biodiversity and climate”.

In the coming years, it will be crucial for us to guide the future of our world and our societies, and some aspects of the SDGs will have to be rethought or adapted. So far, however, the 2030 Agenda is still one of the best international agendas that we have been able to produce, and we must not stop taking action to achieve a better future for all of us.

The second GUNi international conference brought together driven and committed experts, professionals and students from around the world who believe that they can make a positive difference through their actions. In this vein, I would like to thank all of the speakers, participants, collaborators and sponsoring institutions who made the event possible. My thanks go also to the group of first-year students in the bachelor’s degree in Global Affairs at Pompeu Fabra University (UFP) who had a helping hand in the success of the conference.

In this report, you will get a chance to delve into the wide variety of initiatives, projects and actions that researchers, professors and practitioners alike have been putting in place in higher education institutions and their communities in order to achieve sustainable development. Let us not stop taking action!

Josep M. Vilalta
Director, GUNi & Executive Secretary, Catalan Association of Public Universities

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PART I – Key topics, key voices

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Finnish Environment Institute SYKE, Finland

Abstract
The Global University Network for Innovation has organized two conferences on the Sustainable Development Goals (SDGs) of UN Agenda 2030. The first was held in 2017 on “Action and Implementation”, followed by the second on “Higher Education & Science Take Action”, which took place in 2020 at the very beginning of Europe’s Covid-19 lockdown. The timing could not have provided a better opportunity to inform leaders and experts in higher education about the Global Sustainable Development Report 2019 entitled “The Future is Now: Science for Achieving Sustainable Development”. The report was the work of a group of 15 independent scientists, who were enlisted by UN member states to assess the current state of sustainable development and find ways to move forward. By elaborating on the report’s messages on science and education and giving concrete examples from the Finnish context, this paper will seek to provide conceptual approaches and specific ideas on how higher education can transform its strategies, curricula and practices to contribute to the implementation of Agenda 2030, based on effectiveness and equity.

We Are Living Through Interesting Times
If we look at our planet today from space, we can see continents and oceans. On closer look, however, we can witness mosaics of land use, forest fires, destruction of natural environments, artificially lighted areas, growing cities, wars, and plastic pollution floating in the seas. Planetary health, or the loss of it, now impacts human health and well-being. Hardest hit are the poorest countries, populations and families. However, as Covid-19 has shown, the risks are universal. This story reveals that we are living through interesting times as the relationship between human civilization and natural systems takes new forms. The direction of this relationship will greatly affect not only our own well-being, but the well-being of future generations.

The World Is Not Sustainable
Today, the human-nature relationship is not on a sustainable path. This realization has been the driving force behind setting the global compass in the direction of a safe and just planet for everyone. It is the political direction that was packaged as Agenda 2030 and agreed upon by all UN member states in 2015 in order to pave the way for an ecologically sustainable humanity and well-being in the future. Specifically, the focus is on 17 Sustainable Development Goals and a number of general principles, such as leaving no-one behind, taking into account interconnectedness and building on universality. Once Agenda 2030 was signed, countries jointly agreed to call upon science to inform them of the state of sustainable development in the world and how to move forward. A group of independent scientists was tasked with producing a report every four years to provide the latest scientific understanding.
The Crucial Role of Education, Higher Education, Research, Learning and Innovation

The Global Sustainable Development Report 2019 was the first of its kind. In accordance with its mandate, the report broadly reflects our existing scientific understanding of the current state of affairs and, even more so, the ways for us to build paths towards a safe and just future. A series of reports undertaken by heads of state is planned to follow, and institutions of higher education and science must take note. There is a great need for input to the reports, which will be assembled by a scientific group of limited size. However, there is an even greater need to communicate the messages to policy-makers, businesses, cities, communities and individuals.

Eyes are now on the science community: only ten years remain until we reach 2030, the milestone set for the SDGs. Is the science community ready? What is expected of the community? How do we develop a broad knowledge community that can contribute effectively to sustainable development and transform the world into a safe and just place?

A Success Story?

We have witnessed - and the younger generation reads about - the great progress that has been made in the world on many dimensions of human well-being. The gap between developed and undeveloped countries looks very different now than it did in the 1960s, as progress in prosperity and health has been made by every country (Rosling et al. 2018). Today we talk about developed and developing countries. From the perspective of sustainable development, however, every country belongs to the class of developing countries. High prosperity has exacted a cost in developed countries. It has put a heavy burden on global natural systems on which human well-being depends. In many places, the burden is so great that the systems cannot bear it and they now approach tipping points, points behind which systems collapse and reversal becomes very difficult. High prosperity has also created a growing trend in injustice in all countries, not only in monetary terms, but also in social and political terms. The power to direct development on the planet rests in the hands of fewer and fewer people.

Is Agenda 2030 Making Progress?

Undoubtedly, Agenda 2030 sets a direction for the inhabitants of the planet, a direction that has been agreed broadly around the world. But what has happened since 2015? The Global Sustainable Development Report 2019 shows that our progress towards the SDGs is still not on track. At the current pace, only two of the SDGs will be reached in due time, while many had not moved forward at all by 2019 and some were even headed in the opposite direction. The negative trends, which can be grouped under the headings of inequity, biodiversity loss, climate change and waste questions, are especially alarming, because they not only harm their own area, but also hamper the ability of the entire Agenda 2030 to move forward.

Previous attempts (Brundtland Report 1987, Agenda 2020) to bring together economic, social and ecological issues have not lead to a safe and just world. Indeed, development has remained on a path toward deeper and deeper unsustainability. Now we are left with tough decisions. Human societies have been given social and planetary boundaries, within which societal systems must operate if sustainable development is the aim. This means that we need to look at the challenges and the ways to tackle them from a systems perspective and then transform our key societal systems to become radically more sustainable.

Interlinkages Are the Key

To understand why tackling the SDGs individually is not a good way forward, we need to look at how the issues relate to one another. The challenges are highly interlinked. For example, climate change affects not only humans but also biodiversity, water, poverty, hunger and peace. Interlinkages can also be seen between various actions that seek to push ahead on any particular SDG. For example, when France enhanced its climate change mitigation efforts by proposing to raise fuel prices, huge numbers of people came out into the streets to demonstrate, because they felt that the rising prices affected their livelihoods (Editorial, Nature Energy, 2019). Likewise, when diesel was replaced by palm oil, the change in land use affected biodiversity in some tropical countries (Mukherjee & Sovacool, 2014). These examples are simplifications of real-world situations, but they give an idea of the issues at stake. If these idea of the issues
idea of the issues at stake. If these interlinkages between the SDGs had been identified earlier and addressed in advance, the result could have been different. The above examples show negative interlinkages. However, the interlinkages are more often positive, so that making progress toward one SDG leads to making progress toward another SDG (GSDR2019). In this case, it would also be beneficial to know in advance, because resources could be saved. Identifying interlinkages is key to the systemic approach that looks for ideal combinations and proceeds with transformations in a more balanced and informed way.

The Interconnectedness of the World

Under the systems approach, attention needs to be paid not only to interlinkages between the SDGs but also to different regions. The world has become highly interconnected. Roses bought in Europe are grown in Africa, while Europe’s bananas come from Central America, its nuts from Australia and its prawns from Thailand. These flows of goods are often based on agreements that are not fair. The sharing of costs and benefits does not correspond with the real investment and suffering, or with the revenue or enjoyment. Nor is it only goods that flow, but also money, information, lifestyles and many other things. The economy is affected by chains of national and multi-national companies that stand in a key position to make new rules of the game. Governments need to take a holistic, long-term perspective. International collaboration fosters global resilience.

Actors with Power Can Push Sustainability Transformation Forward or Stand in the Way

Lastly, there are many players, such as science institutions, businesses, governments, cities and individuals, who identify challenges, find sustainable pathways and build sustainability transformations. Many of these actors are also the ones who suffer from unsustainable systems, from individual actions and from the unsustainability of the future. Some actors, however, earn high revenues from the present situation and unsustainable systems. They include countries, companies, cities, individuals, and potentially institutions in science and education (GSDR2019). Today’s winners are reluctant to make radical changes, because change may jeopardize their future revenues. However, there is clear evidence that if inequality keeps growing and the environmental commons are radically disturbed, it will hamper not only economic growth but also the well-being of everyone on the planet. This is reflected in the Covid-19 pandemic.

New Questions to Be Answered

What makes it so difficult to tackle the challenges of sustainable development is that they can be characterized as “wicked” to deal with. Not only are they interlinked, but they are often highly contested in society and there are clear knowledge gaps. Here science can help by bringing knowledge to bear on the situation and provide ways to move forward. When we have “wicked” problems at hand, we cannot expect a clear solution that will dispel the unwanted situation. We can only inform society of alternative paths and gradually make a change by pushing the situation onto paths that will lead society towards a more resilient state. The clear message from the Global Sustainable Development Report 2019 to the science and education communities is this: we cannot pretend that “wicked” problems are simple, or that they are complex and complicated. We should not do research or teach about them using approaches and methods that are not suited to them. In this respect, sustainability science offers the tools needed for “wicked” sustainability questions and it should be a focus of teaching and research at universities and other institutions of higher education (Messerli et al., 2019).

Moving from Goal Setting to Real-Life Changes

When Agenda 2030 and the SDGs are to be implemented in countries and institutions, goals and approaches do not necessarily help. Something more rigid and more concrete is needed. This is the reason why the most efficient way for governments and institutions to implement the goals is to identify key societal systems and transform them. The focus should be put on issues where action is taking place and on decisions that are being made, all while simultaneously contributing to several, if not all, SDGs.
Matrix for Redirecting Global Development

The Global Sustainable Development Report 2019 identified six key societal systems that are unsustainable and need to be transformed, all at the same time, to become sustainable. According to the report, this is the framework that will make it possible to turn global development onto sustainable paths in spite of the huge challenges. The six entry points are:

- Human well-being and capabilities
- Sustainable and just economies
- Sustainable food systems and healthy nutrition
- Energy decarbonization with universal access
- Sustainable urban and periurban development
- Securing the global environmental commons

To bring about these transformations, four levers of action are needed. These levers must not simply have their own agenda, but they must work effectively in an integrated manner, pushing each other and the system towards sustainable tracks (GSDR2019). The four levers of action are governance; funding, business and investment; individual behavioural change and collective action, and science and technology. This is a joint endeavour that calls for integrated action. The most important, but also the most challenging lever is to put sustainable development at the heart of all planning, decision-making and especially budgeting. Simply patching ... processes will not deliver enough, because budgeting processes are so sophisticated and have such long path dependencies that they do not allow for major changes. Therefore, it is often necessary to start again from the basics and build a model that has a totally new foundation, structure and process. Countries and cities are now at work on mission-oriented budgeting, which is the first step in building a foundation for sustainable development (e.g. Oslo, Turku, Iceland, Finland, New Zealand). They support each other in this effort through networking and co-learning.

The framework in the Global Sustainable Development Report 2019 moves from a matrix of six entry points to systems transformation through four integrated levers. As countries and other institutions position themselves very differently on the starting blocks because of their present state and sociocultural setting, the levers need to be tailored accordingly. In Finland, for example, there is a need to pay particular attention to the burden on the global environmental commons and to spillovers from consumption and production patterns. For example, Finland’s food chains, which stretch far beyond its national borders, require major transformation towards sustainability. While public food services and especially daily hot meals at school contribute to healthy eating, ecological sustainability and transformation are needed in order to use less animal protein and reduce food waste (Kaljonen et al., 2019, 2020). In Nigeria, the challenges in food chains involve getting fresh, healthy food to market and overcoming the pressure of food waste on social sustainability (GSDR2019). In both countries, these examples show how the four levers can be used in an integrated way to drive transformation.

Higher Education Institutions Have a Key Role to Play

Systems transformation cannot be achieved by a single actor; many players are needed. Science can do much to help. In many situations, science can take the role of leading or facilitating processes. Science is needed at many different levels too. All disciplines have a role to play when raising our understanding of interlinkages, challenges, targets, actions, flows and actors. There is also a need to understand where power lies and how it is used and controlled. Lastly, through transdisciplinary research, science is needed to contribute to, moderate and lead processes of transformation, together with other societal actors who are relevant to the system in question (Messerli et al., 2019).

There is already plenty of existing research that is not being put to use. To make it usable, meta-analyses and integrated assessments should be put in place. The co-development of governance by researchers, policy-makers and other actors also needs to be put to the test and implemented, and science diplomacy is needed now more than ever.

These steps will not be possible until the gap in science capacity between wealthy countries and poor and low-income countries becomes narrower or is closed. Given the hyperconnected nature of our world, sustainable development can only be reached if it is universal. Therefore, decision-makers need to be informed about their context by their own researchers, and transformations require national researchers to moderate them. The shift calls on developing countries to see the
benefit of the effort, invest in science capacity and university curricula, and increase the ambition of researchers to aim for joint partnerships. However, it also calls on the Global North and West to build networks with the Global East and South in training, funding, infrastructure, etc. Finally, a moonshot needs to happen in order for universal sustainability science to increase today’s capacity tenfold and ensure that necessary societal transformation towards sustainable development paths takes place on a global scale.

**Are Science Training and Science Practices Currently Suited to This Effort?**

Universities and other institutions of higher education are now discussing their stake in Agenda 2030. The issue has several dimensions: what to teach, what to research, and how to run the infrastructure and practices that contribute to the SDGs. The changes could be small steps that are themselves important. They might include decisions such as mandatory training programmes on the SDGs and logistics on campus. However, a careful reading of Agenda 2030 and the action points in the Global Sustainable Development Report 2019 points to a need for more fundamental changes. How can higher education institutions facilitate the use of existing knowledge effectively in societies and promote justice? How can institutions enhance open access to research for scientists, young people and policy-makers globally? How can they reach collaborative arrangements with businesses to enhance systems change towards sustainability and build more just rules for global flows? How can resources in higher education institutions be directed towards sustainability science by opening up the entire budget? These and many other questions confront every institution that seeks to contribute to the implementation of Agenda 2030 in order to have a major impact and foster justice.

**Learning Starts in the Home, Community and School**

The stages of adolescence, childhood, early childhood and pre-birth are crucial for the development of cognitive skills and many other skills that are needed to ensure that higher education delivers learning. Health and nutrition, security and trust, all contribute here. Education for sustainable development, led by UNESCO, recommends that pre-school and school curricula include the teaching of systems thinking, problem solving, critical thinking, empathy and recognition of peace as a virtue, as well as teaching on how to reconnect human civilization with the natural system (Koskela, 2019).

**Conclusions**

The Sustainable Development Goals are goals to be striven for. The deadline is 2030. Though goals are seldom achieved in full, they point the compass and push for radical progress in the agreed direction. We have witnessed on a daily basis - particularly amid the Covid-19 crisis - that the clock is ticking and human civilization needs to innovate towards a new normal, soon. We stand at a crossroads. We have the tools. The future is now and it is time to act.

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Gender Equality in Education: The Key to Sustainable Development

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Abstract
This paper defines education from the perspectives of Nelson Mandela and Indira Gandhi, who said that it is not just an equalizer but a liberating and democratizing force that cuts across the barriers of caste and class, smoothing out inequalities imposed by birth and other circumstances. The paper goes on to look at gender equality in education, defining the concept and identifying the different gender relations while taking the view that the push for gender equality must become an integral part of our sustainable development agenda. Nothing summarizes this understanding better than the statement made by Gro Harlem Bruntland in the Global Sustainable Development Report, 2019: “If we do not put inequality at the heart of the global development agenda, we are doomed to failure”. The paper highlights the unequal participation of women in higher education as an issue that influences their equal participation in contributing towards the attainment of sustainable development by any country. Lastly, the paper looks at how institutions of higher learning can be more responsive to the needs of society through the knowledge they generate to aid in addressing the inequalities that exist not just in STEM education within their own environments but also in the societies within which they operate and which they are supposed to serve.

Introduction
Education, as Nelson Mandela said, is “the great engine of personal development through which the daughter of a peasant can become a doctor; the son of a mineworker can become the head of the mine; the child of farm workers can become the president of a great nation”. Mandela presented education as an equalizer that knows no boundaries in its capacity to transform an individual irrespective of his or her gender. This is further confirmed by Indira Gandhi’s definition of education as “a liberating force, and in our age also a democratizing force that cuts across the barriers of caste and class, smoothing out inequalities imposed by birth and other circumstances”.

The world’s oldest UN Agency, UNESCO, strongly believes that education transforms lives and is key to building peace, eradicating poverty and driving sustainable development. Moreover, UNESCO emphasizes to its Member States that education is a human right for all throughout life and access must be matched by quality. Education is therefore a path for the integration of an individual into society and the best investment in sustainable development.

Gender Equality and Education
Gender is a social construct and not synonymous with women. It is a relational concept focusing on power dynamics and the roles and responsibilities of women and men; it is not about biological differences but includes expectations about characteristics, aptitudes and likely behaviours of both women and men (femininity and masculinity). Briefly, “gender” defines the boundaries of what women and men should be and do.

Gender equality, on the other hand, exists only when women and men enjoy the same status and have equal opportunity to realize their full human rights and potential to contribute to national, political, economic, social and cultural development, and to benefit from the results. According to UNESCO, gender equality is the equal valuing by society of both the similarities and the differences between women and men and the different roles they play.
To talk about gender equality, we cannot avoid looking at gender relations in the context of education. Education plays a major part in determining the roles that people play in society since these roles are learned during the socialization phases of childhood and adolescence and they are shaped and entrenched by family, school, peers, culture, religions, media, gender ideologies, etc. In addition, political status, class, ethnicity, physical and mental disability, age and other factors also modify gender roles. On the other hand, the way that people view themselves (their gender identity), who they believe they are, drives their perceptions of the world. This includes their interactions with others, their construction of meaning, their choices and behaviours, and the way they fulfill the responsibilities of their many roles. How they carry out each role is influenced by the identity they develop for themselves. In other words, people learn to define their own identity in accordance with their beliefs, their socialization and their interests and interactions with others. The final aspect of gender relations is linked to the gender power structure, which depicts the way power and influence are distributed between genders and sustained by legal and social frameworks.

These points explain Rousseau’s belief in the power of education when he stated that “human beings are good by nature and education should serve to empower them to cooperate in society”. The three aspects of gender relations exist because of empowerment through education – however, education can also be either inclusive or discriminatory. If we look at education as the act of teaching or training, we can agree with those like Rahab Saeed who say that “by educating an individual, we attempt to give him some desirable knowledge, understanding, skills, interests, attitudes and critical thinking. As an individual in the society, he has to think critically about various issues in life and take decisions about them being free from bias and prejudices, superstitions and blind beliefs... all of which are learnt through the process of education”.

Gender Equality and Higher Education

Men and women, boys and girls – they all encounter gender differences when striving to attain their educational goals. This leads to gender disparities, which remain among the most persistent forms of inequality across all countries and affect half the world’s population. The Human Development Report’s Gender Equality Index (which measures women’s empowerment in health, education, and economic status) shows that overall progress on gender inequality has continued to grow in recent years (UNDP, 2019).

Yet, we know that gender inequality has long been associated with persistent discriminatory social norms that prescribe social roles and the power relations between men and women in society as well as values, beliefs, attitudes and practices that assert preferred power dynamics for interactions between individuals and institutions (UNDP, 2019). To understand gender equality in any sector, we must identify the gender inequalities that exist in that sector. The push for gender equality must be an integral part of our sustainable development agenda. This is very well summarized by a former prime minister of Norway, Gro Harlem Brundtland, in the Global Sustainable Development Report 2019. “If we do not put inequality at the heart of the global development agenda, we are doomed to failure”.

Over the years, women’s participation in education has increased. Women are now the majority in higher education. However, inequalities still exist in women’s participation in science, technology, engineering and mathematics (the so-called STEM subjects) in higher education and the gap continues to widen. Long-standing biases and gender stereotypes are steering girls and women away from science-related fields. Target 4.3 of SDG 4 focuses on “ensuring equal access for all women and men to affordable quality technical, vocational and tertiary education, including university, by 2030”. Indeed, during the past fifteen years, the global community has made great strides in inspiring and engaging women and girls in science. However, women and girls continue to be excluded from participating fully in science. Research indicates that today only 29.3 per cent of researchers worldwide are women and only 35 per cent of all female students select STEM-related fields in higher education. UIS statistics reveal that women, despite improved access to education, still face considerable barriers as they move up the research ladder (https://tellmaps.com/uis/gender). Furthermore, the enrolment of female students worldwide is particularly low in ICT (3%), natural science, mathematics and statistics (5%), and engineering, manufacturing and construction (8%) (UNESCO, 2014 - 2019). It is important to note, however, that none of the SDGs can be achieved without the engagement of scientific knowledge and interventions: Science,
technology and innovation underpin almost all the SDGs and the effective realization of the global 2030 Agenda for sustainable development. As UN Secretary-General António Guterres noted in the Global Sustainable Development Report 2019: “Our world as we know it and the future we want are at risk. Science is our great ally in the efforts to achieve the Goals”.

The reality we face is that tackling some of the greatest challenges of the 2030 Agenda for Sustainable Development – from improving health to combatting climate change – will rely on harnessing all talent. Diversity in research expands the pool of talented researchers, bringing in fresh perspectives, talent and creativity. Bridging the gender gap in STEM is vital to achieving the Sustainable Development Goals and creating infrastructure, services and solutions that work for all people. We all must focus our attention, therefore, on ensuring gender equality in STEM education at the higher education level, not only for more equal higher education but also for more just and inclusive participation in the three dimensions of sustainable development, namely the social (inclusion of people), the economic (prosperity for all) and the environmental (protection of our planet). Moreover, all three dimensions are only achievable through the existence of peace and partnerships, neither of which can exist when some members of the population are excluded and/or marginalized. We need adequate gender-responsive policy frameworks in our institutions of higher learning, a shift in institutional and societal attitudes towards gender equality in education, a revamped pedagogical approach to the teaching of STEM and, above all, a more gender-responsive STEM workplace.

The Role of Higher Education and Science in Sustainable Development

Sustainable development is development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs, and it is development that ensures that people can live a life in dignity and prosperity on a healthy planet (Bruntland Commission Report, 1987). The attainment of sustainable development begins with the acknowledgement of existing inequalities and the need to address them. All the Sustainable Development Goals are a means to achieving the ideals of Agenda 2030 for sustainable development. However, most of the Sustainable Development Goals need university engagement and the collaboration of the entire higher education sub-sector for their achievement. There is a need for effective collaboration, social responsibility on the part of everyone and, of course, knowledge provision and generation, research and dissemination. With Agenda 2030 as a plan of action that focuses on a better life for people on a healthy planet to be achieved in peace and through the coalition of , the quest for gender equality is now more imperative than ever before. All research and knowledge to be generated must engage a gender lens, while social responsibility and all forms of collaboration must consider gender equality as an integral part of any sustainable development agenda. None of the Sustainable Development Goals can be achieved without ensuring the equal participation and contribution of all members of society in all sectors. In short, the need for gender equality in education is central to everything we aim to do: From the eradication of poverty to ensuring good health and well-being to building partnerships.

Universities have a responsibility to serve society and to help in improving people’s livelihoods. They transform people’s lives through education and through the wider impact of our research. The knowledge that is generated creates businesses and jobs, thus enriching society and fostering the sustainable development of societies. Universities must take the lead in advocating for gender equality in education and should be seen to be more inclusive and gender-responsive. They must also be held accountable for their ineptitude in addressing the widening gender gap in the sciences in higher education. The furthest behind in any society must be reached first and the cycles of disadvantage and inequality must be broken. Institutions of higher learning must not only acknowledge that differences and inequalities between women and men and between boys and girls require attention, but they must also be ready to articulate policies and initiatives which address the different needs, aspirations, capacities and contributions of women and men and of girls and boys. This is the transformative aspect of leadership and policymaking that is so much in need at this time of striving to attain sustainable development for countries.

Higher education needs to ensure the existence of gender-transformative leadership as an imperative to serve society in a more effective and inclusive manner. We need higher education institutions where leadership takes responsibility to ensure that the education provided by their institution does not focus solely on quality but is also devoid of any discriminatory practices. This is leadership that ensures the existence of policies and
initiatives that challenge any policies, practices or programmes that are biased or discriminatory; it is leadership that affects change for the betterment of life for all. It is only in this way that the root causes of gender inequalities can be effectively addressed and dismantled. Such leaders must place people, irrespective of their gender, at the heart of all decision-making processes. This is only way that gender equality can be achieved in all fields of study and all sectors of the economy, so that sustainable development will be attained.

Gender Equality, Climate Change and the Fourth Industrial Revolution

The 21st century is defined by two issues that affect development, namely climate change and technological transformations. We must never forget that as we embrace the Fourth Industrial Revolution, technological advances such as machine learning and artificial intelligence can leave behind an entire group of people, even whole countries, hence shaping inequalities in human and national development. Such technological innovations risk further entrenching existing inequalities, introducing new ones and, through unintended consequences, setting back progress towards Agenda 2030. A gender lens is imperative when addressing issues of climate change and technological advancement. The gender gap in technology should be an additional source of concern as we strive for gender equality in education. This perspective will help us to ensure gender equality in technical knowledge. We must address the issues that hinder gender equality in education at all levels and in all spheres of life.

To this aim, we must realign our policy goals; we must emphasize quality gender-responsive education for all ages and at all levels. It is time for us to think about a life-cycle approach to the acquisition of knowledge in STEM education. We must equip all learners with the skills to enable them to mitigate and adapt to persistent climate change. In the same context, we must equip teachers with gender-responsive pedagogical and technological skills. This will help us to eradicate all forms of gender inequality in society as we ensure gender equality in STEM education at all levels, particularly in higher education. It is only by ensuring gender equality in educational opportunities that we can expand human capabilities and achieve the ideals of Agenda 2030 for sustainable development.

Conclusions & Recommendations

We must all call upon the business community, science and research institutions, academia, and all governments to take an active stake in bridging the gender gap in STEM in higher education, which effectively translates into a gender gap in the STEM workforce. Actively promoting gender equality in the sciences has the potential to lead to substantial knowledge and social and economic gains. We must invest in education that provides opportunities for men and women, boys and girls, to learn, grow and innovate in science and technology, and we must push for companies around the world to promote gender equality and women’s empowerment in the workplace and the community. To reduce the gender gap in any sector and particularly in the sciences in universities, we must go beyond the numbers and identify the real issues that deter women and girls from pursuing careers in the sciences. To affect change, we need relevant, up-to-date and accurate data. In our statistics, we need to move beyond mere breakdowns by sex to breakdowns by gender and we need to identify the qualitative factors behind the figures in order to support decision-making, policy development and strategic planning.

We must never forget that scientific and technological progress will mark our future, yet this progress can only be achieved when women and girls are creators, owners and leaders of science, technology and innovation. Bridging the gender gap in the STEM fields is vital to achieving the Sustainable Development Goals and creating infrastructure, services and solutions that work for all people. Universities have a social responsibility to the society they serve, and they must ensure that any knowledge that is generated has gender-disaggregated data and helps to address people’s needs for prosperity on a healthy planet. Moreover, the universities of the 21st century must provide skills for the job market while ensuring that STEM graduates, irrespective of their gender, are equipped with entrepreneurial skills for innovation and job creation. These are the needs of our time.
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Achieving the SDGs and Realizing Human Rights: is Higher Education Fit for Purpose? The Links between Human Rights and Sustainable Development

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Introduction

The 2030 Agenda for Sustainable Development envisions “a world of universal respect for human rights and human dignity.” It reaffirms “the importance of the Universal Declaration of Human Rights and other international human rights instruments relating to international law,” and explicitly states that the Sustainable Development Goals (SDGs) “seek to realize the human rights of all” relating to international human rights instruments. This implies that the political commitments reflected in the SDGs are underpinned by legally binding human rights obligations, which most states have already signed up to. In short, there will be no sustainable development without human rights, and no realization of human rights without sustainable development.

The links between human rights and the 2030 Agenda are very clear. The Danish Institute for Human Rights has shown that 92% of the SDG targets are linked to specific provisions of core international human rights instruments. This implies that the political commitments reflected in the SDGs are underpinned by legally binding human rights obligations, which most states have already signed up to. In short, there will be no sustainable development without human rights, and no realization of human rights without sustainable development.

The obvious example is how SDG 4 on quality education is related to human rights. The promise to ensure access to quality education for all is reflected in the Universal Declaration of Human Rights and a range of other human rights instruments relating to women, children, persons with disabilities and indigenous peoples, among others.

Figure 1. The links between SDG target 4.3 and the Universal Declaration of Human Rights

1. UN Doc. A/RES/70/1: Transforming our world: the 2030 Agenda for Sustainable Development, para. 8
2. Ibid., para. 10
3. Ibid., para 11
4. Ibid., para 4.
5. See: https://sdg.humanrights.dk/
The realization of human rights, including the human right to quality education, is a long-pending obligation. It was fundamentally established in 1948 with the adoption of the Universal Declaration of Human Rights, and subsequently reaffirmed in other international human rights instruments. However, despite institutionalized reporting and monitoring mechanisms to foster accountability, the human rights system has not driven sufficient action to realize the right to education over the past 72 years.

In this context, the SDGs provide us with a universal action plan for realizing the human rights of all people, with timebound targets and indicators for measurement and with global commitment and traction. It appears to be our best engine for action, but is inherently weak in terms of accountability mechanisms.

In summary, we have an SDG accountability gap and a human rights implementation gap, with overall convergence of substance and complementarity of frameworks, mechanisms and procedures. Hence, there is potential for pursuing a win-win solution for joined-up, efficient action on human rights. Moreover, there is urgency as well as political, moral and legal imperatives to stand on: we need to move development in a sustainable direction, for our generation and for the future.

Obstacles on the Way

Despite global commitment to the transformational 2030 Agenda and obligations under human rights law, implementation efforts since 2015 have been insufficient and the world is off-track to achieve the SDGs. The obstacles seem to be related to lack of will and capacity:

- **Lack of will to change**: some states are pushing back and are not interested in building operational bridges between human rights and SDG implementation. This may be to maintain the status quo, even when it is one of increasing poverty and inequality, accelerated climate change and environmental degradation.

- **Lack of capacity to change**: compartmentalized mindsets, institutions and systems are challenged by the comprehensive, interrelated, interdependent 2030 Agenda. The mechanisms established to monitor the implementation of international human rights (treaty bodies, Special Procedures and the Universal Periodic Review under the Human Rights Council) have produced thousands of recommendations that are directly relevant for guiding SDG implementation in specific countries and for certain groups of rights-holders, such as women, children and migrants.

These recommendations are in pure text. They are available in UN databases, but their form and presentation are mainly aimed at an exclusive audience of human rights experts. This severely limits the potential for using these recommendations to inform and guide SDG implementation by governments (particularly government institutions that do not work directly with the human rights system such as ministries of planning, education, transport and agriculture), and inform and enable civil society to hold governments to account.

The Need for Innovative Operational Solutions

The lack of will is ultimately a political question, in which decision-makers need to be held accountable for their commitments to citizens. However, we need innovative operational solutions to help overcome capacity gaps.

At the Danish Institute for Human Rights, we set out to build a practical bridge between human rights and SDG implementation. The mechanisms established to monitor the implementation of international human rights (treaty bodies, Special Procedures and the Universal Periodic Review under the Human Rights Council) have produced thousands of recommendations that are directly relevant for guiding SDG implementation in specific countries and for certain groups of rights-holders, such as women, children and migrants.

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The recommendations of the international human rights system constitute an enormous but underutilized resource that the world cannot afford to overlook as we strive to realize the SDGs. Therefore, at the Danish Institute, we have built the SDG–Human Rights Data Explorer10.

Using a text-mining algorithm, the Data Explorer categorizes over 150,000 recommendations of the UN human rights system and presents them in relation to specific SDG targets. The recommendations are easily available in a multilingual database. With just a few clicks, the user can find out which UN human rights mechanisms have been recommended for a specific country under a specific target and, where applicable, for a specific group of rights-holders.

The 9,723 recommendations available for SDG 4 on quality education highlight the potential for using these recommendations to guide SDG implementation in countries across the globe. For example, under SDG target 4.3 on equal access to higher education, the Committee on the Elimination of Discrimination against Women (CEDAW) recommended that Spain should:

- Intensify its efforts to provide specific training and to diversify academic and vocational choices for women and men and take further measures to encourage women and men to choose non-traditional fields of education and careers;
- Ensure that all gender stereotypes are eliminated from textbooks and that school curricula, academic programmes and professional training for teachers cover women’s rights and promote gender equality;
- Provide mandatory, comprehensive and age-appropriate education on sexual and reproductive health and rights.

The above is just one example of how the human rights system can contribute to sustainable development. At a meta-level, the SDG–Human Rights Data Explorer is an example of how technology can help us build a bridge between siloed universes. Thus, it can bring us one step closer to the holistic thinking of all society that is needed if we are to make at least significant progress towards sustainable development by 2030.

Enablers of Innovative Solutions

The SDG–Human Rights Data Explorer builds on an advanced text-mining algorithm that categorizes human rights recommendations against the 169 SDG targets. Interestingly, this was not developed by a tech giant or a university but by a consultant from Specialisterne11 in close collaboration with staff of the Danish Institute for Human Rights12. Specialisterne is a socially innovative company where the employees have an autism spectrum diagnosis, which often makes studying in a higher education institution or accessing employment difficult. The success in developing the SDG–Human Rights Data Explorer underlines that human diversity is an enormous but underutilized resource that we cannot afford to overlook.

The diversity of the team’s knowledge and skills was a key element of the innovation process. Moreover, the team was driven by a vision of purpose and took an experimental and empirical approach, which required flexibility in timing and budgeting and implied a willingness to fail. From the outset, it was decided that the team should be open to partners, pursue co-creation and have a generous, radical approach to sharing.

In general, this has been a unique experience. To benefit from the lesson learned, we need to ask ourselves: are we fit for purpose, do we organize our institutions around these elements?

The general answer for the human rights system would unfortunately be no. We are limited by self-imposed perceptions of how things must be done and who to work with, within fixed budgets and timeframes. This brings me to the last point: the need for disruption within higher education institutions.

Constructive Disruption in Higher Education Institutions

In her keynote presentation at the 2nd GUNi International Conference in 2020, Professor Tilbury13 spoke about the need for disruption within higher education institutions.

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PART I - Key topics, key voices


15. https://www.youtube.com/watch?v=U72xkMz6Pxk

Young leaders such as Greta Thunberg, whose key message is that “our house is on fire” 14. Meanwhile, our political system seems to respond by dragging its feet or adding more fuel. The urgency of this is underlined by young leaders such as Greta Thunberg, whose key message is that “our house is on fire” 14. Meanwhile, our political system seems to respond by dragging its feet or adding more fuel.

The 2030 Agenda is a transformative agenda, the best and only global agenda for sustainable change that we have. Higher education and human rights need to be part of solution, not the problem. First and foremost, we must realize that we will only succeed if we manage to transform our institutions, within the fields of higher education and human rights.

As underlined in the GUNi Conference, the change within higher education institutions needs to be profound and comprehensive. It should encompass curricula, learning, classrooms and catering. Higher education institutions must not wait for consensus but take a leadership role, assume ethical responsibility, inspire change and consistently assess their impact.

Human rights are inherently value-based, through the recognition of the inherent value and dignity of every individual. Human rights can be a creative force that inspires change. Human rights also add contents, analysis, data, guidance, accountability and durability. Human rights come with heads, hands and institutions. Within higher education institutions, we need to set human rights free from their current containment in faculties of law. We need to follow human rights principles to make institutions more inclusive and accommodate diversity.

Partnerships are key for achieving sustainable development; no-one can significantly move this tremendous agenda on its own. We need concerted efforts, synergies, sharing, learning, communication and recognition of the value of diversity. We need to build bridges to break out of institutional silos and to develop practical solutions, tools and approaches that are simple, cost-efficient and implementable, and ultimately bring about change that matters in people’s life.

SDG target 4.7: by 2030 ensure all learners acquire 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 of culture’s contribution to sustainable development.

SDG target 4.7 constitutes a point of convergence and a practical starting point for bringing human rights and higher education together.

Currently, there are separate communities promoting and pursuing human rights education (HRE) and education for sustainable development (ESD) that do not necessarily collaborate even though they are so obviously interrelated. The siloed communities are also reflected in the respective institutional anchorage in the UN system: ESD within the United Nations Educational, Scientific and Cultural Organisation and HRE within the Office of the United Nations High Commissioner for Human Rights. In my view, a first step towards joint disruption would be to break.
Rankings and SDGs: Should HEIs Be Ranked for their SDG Performance?

Ellen Hazelkorn
BH Associates education consultants, Ireland

Introduction

In an era of post-truth and fake news, one of the most prominent issues of public and political focus today is the extent to which universities contribute to the public good. In many countries, concerns about student learning and employability, and growing disparities in wealth and opportunity have sparked a deep sense of grievance and decline in public trust. As questions about the universities’ contribution to the public good are raised, rankings are also focusing on societal impact.

In this environment, the seventeen UN Sustainable Development Goals (SDG) have become a very public symbol and policy instrument. They are used by students and academics, by universities and countries, and by research and other agencies to demonstrate, measure and assess commitment to global societal challenges. Beyond the specific SDG targets, their collective value is embedded in the recognition that societal challenges are transnational, require access to resources (human and capital) beyond the capability or capacity of individual countries and institutions, and hence require multinational and multi-disciplinary teams. In an age of neo-nationalism, the SDGs highlight the necessity of multilateralism.

Ranking SDGs

Rankings often portray themselves as promoters of greater public information and disclosure. But too often they measure benefits gained from accumulated public and/or private wealth and investment over decades if not centuries. Their choice of indicators cherish the benefits of attracting high achieving/high socio-economic students who graduate on time and go on to have successful careers. Excellence is measured in terms of research and reputational achievements of individual universities rather than as a collective contribution to the public good.

So, we should give some credit to the Times Higher Education Impact Ranking which is currently the only ranking to assess university performance against the SDGs. GreenMetric World University Rankings, launched in 2010, compares university commitment to going green and sustainability, while U-Multirank includes indicators for regional engagement.

Times Higher Education (THE) launched its SDG ranking in 2019. Of the almost 20,000 HEIs worldwide, according to IAU World Higher Education Database, only 858 submitted data to the 2020 edition, an increase of approximately 300 since 2019.

The methodology assesses activity against: research, stewardship, outreach and teaching. With the exception of data from Elsevier, universities submit evidence, examples and data against at least four of the SDGs. Research accounts for 27% of each SDG against which data is submitted.

THE evaluates each submission. The overall score is calculated on the basis of the three best SDG scores, plus performance against SDG 17.

Monetisation of university data

Not only is gathering the material for submission a lot of work, but it is unlikely that THE can control or validate the accuracy and comparability of the information provided by the universities. Anyone with experience of evaluating large scale projects will understand the magnitude of the work involved and the necessary integrity and transparency of the process.
The HE carries out the evaluation behind closed-doors. The submissions provide a lucrative treasure trove of institutional data which remains behind a pay-wall. This exposes one of the biggest developments of recent years – the monetisation of university data by commercial rankings and publishing organisations.

There is little evidence that these rankings – or their predecessors – have had any meaningful impact on improving quality, which is a context-dependent multi-dimensional concept. Rising in the rankings is not equivalent to improving quality which is why we are beginning to see reaction in the Netherlands and China against using citations as a meaningful measure of academic performance. In fact, it is very possible to rise in the rankings without making any significant contribution to the public good.

So what actions might work?

Are there better and more meaningful and sustainable alternative ways to embed SDGs goals?

1. Having a good quality assurance system which includes university commitment to the public good in all its dimensions: civic, social, economic, cultural and intellectual – would be a good place to start. The European Quality Assurance Forum (EQAF) 2019 focused on social engagement, and FINEEC, the Finnish agency, is beginning to address societal engagement and impact in its processes. It very likely other QA and accreditation agencies will follow suit.

2. Many governments are promoting a system approach which aims to reframe the social contract around the role and responsibilities of higher education institutions, working collaboratively with other providers and social partners rather than promoting atomised institutions. These instruments are less concerned with rankings and more about public responsibility. Performance agreements and compacts, targeted funding, and performance-based funding aim to balance individual institutional and collective values and objectives of/for society.

3. International organisations have a role to play. U-Multirank has the potential to play a bigger role because it is an European Union initiative with the “authority” of member states. The World Bank benchmarking approach enables universities to choose indicators most meaningful to them. UNESCO, alongside OECD and/or the World Bank, might consider a joint initiative.

Assessing the social responsibility of rankings?

There is no doubt colleges and universities should take their responsibilities to society and the “public good” extremely seriously and be assessed accordingly. But shouldn’t rankings be assessed against the same objectives – given that their effect has been to promote elitism and undermine equity and diversity?

Despite their calls for greater transparency and accountability, their methodologies display very little evidence of either. Universities provide bundles of data free to non-transparent process and held behind pay-walls. It’s no longer good enough to only talk about universities’ corporate social responsibility (CSR); isn’t it time we talked about the CSR of the ranking organisations themselves?

*This piece was originally published on University World News on 21 March 2020. The original article is available at: https://www.universityworldnews.com/post.php?story=20200317145134326
PART II – Integrating Student Leadership in Sustainable Actions
The Sustainable Water Initiative: A Case Study of How the Higher Education Community Can Foster SDGs, Student Leadership and Innovation

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Abstract
Achievement of the ambitious, universal, interconnected 17 Sustainable Development Goals (SDGs) (2015-2030) requires a huge effort and effective collaboration between all key community stakeholders, including NGOs, public authorities and the private sector. This article shows how the higher education community can play an active role in implementation of the SDGs.

As a case study, this contribution introduces the Sustainable Water Initiative (SWI) and its components. This student initiative has been implemented with the collaboration of three bodies: the Universitat Rovira i Virgili (URV), the Kafr Ghatati Association for Community Development (KGACD) and the Plastics Initiative. The SWI directly affects three of the seventeen SDGs: SDG 3 (good health and well-being), SDG 6 (clean water and sanitation) and SDG 14 (life below water). Through its online platform and onsite activities, the SWI aims to deliver safe, accessible, affordable drinking water for people who lack it. In addition, it aims to raise awareness of the correct use of water resources and related plastic products (such as bottles). The initiative started its first project in Egypt with a vision to reach regions with greater need in Africa and Asia in the future. This article explains the six main sustainability components adopted to ensure the successful implementation of the initiative. These components have been evaluated for better future implementation.

Introduction
Student engagement in higher education is a shared responsibility between all the stakeholders in the process (Kahu, 2013). Effective teaching methods can increase students’ engagement in higher education (Collaço, 2017). In addition, complementary extracurricular activities can promote and strengthen student development (Singh and Srivastava, 2014).

Capacity building and partnerships are among the key elements needed by higher education in the endeavour to achieve sustainable development projects in local communities (Shiel, 2015). Corporate social responsibility (CSR) activities can have a positive impact on the value of companies (Houqe, 2019), and higher education institutions can benefit in the same way. The implementation of CSR activities by the university through student-led projects can be expected to have a positive impact on academic performance (Deng, 2018).
general, it is important to adopt initiatives and projects that can build the capacity of university students while they also achieve a sustainable impact on society.

The Sustainable Water Initiative

The Sustainable Water Initiative was founded to provide safe, accessible, affordable drinking water for people in need in developing countries, especially in Africa and Asia. The aim was also to build the capacity of local communities and raise awareness of the use of water resources and related products, particularly those made from plastic. The initiative was based on the resources of an international development project run by the Rovira i Virgili University (URV). It was initiated by a master’s degree student with the support and guidance of a university lecturer.

The initiative’s first project took place in Giza, Egypt. The aim was to install a water treatment unit to produce drinkable water for 3000 people a day, with a future expanded capacity of 5000 people. The main reasons for choosing this location were the poor quality of available water and the high price of alternatives such as bottled water or treated water from local providers.

The SWI is connected directly to the targets of three of the seventeen SDGs. The first, Goal 3 (good health and well-being), is focused on ensuring healthy lives and promoting well-being for all at all ages. The second, Goal 6 (clean water and sanitation), aims to ensure availability and sustainable management of water and sanitation for all. And the third, Goal 14 (life below water), aims to conserve and sustainably use the oceans, seas and marine resources for sustainable development (UN General Assembly, 2015). These three goals interact with many other of the 17 sustainable development goals positively and negatively (Nilsson, 2016).

Main Sustainability Components

To ensure the sustainability of the initiative and its projects, six sustainability components have been adopted. As shown in Figure 1, these six sustainability components are: fund sharing, follow-up agreement, online platform, local community engagement, management and supervision, and quality and resilience.

![Figure 1. Sustainability components considered in the sustainable water initiative](image)

- **Fund sharing**
  The success of development projects is governed by many factors such as the complexity and size of the project, scheduling, the stakeholders’ previous experience, fund management, resource availability and the political and socioeconomic situation (Das, 2017). The fund sharing component addresses one of these factors: fund management and resource availability. The total budget was divided between SWI (35% of the total) and KGACD (65%).

- **Follow-up agreement**
  A follow-up agreement has been signed between SWI and KGACD. Every three months, the local NGO that operates the water treatment unit must report on the operational status and the periodic maintenance of the initiative. These periodic reports help to evaluate the project’s sustainability, know when to make an intervention and design better models for future projects.

- **Online platform**
  The online platform works as a marketing tool for the initiative. The initiative’s website contains all the details of previous and current projects. It has a place for news, photos, and videos from the projects implemented on the ground. Most importantly, it contains a section for some awareness products. These products will be used to provide resources to help the initiative in its future water projects in Africa and Asia.

- **Local community engagement**
  Local communities want to collaborate with non-governmental organizations (NGOs) to find solutions for the challenges they face (Weaver, 2018). To achieve their
goals efficiently. Developmental projects should be based on public trust and confidence in the charities involved (Hyndman, 2017). For this reason, the first phase of the project was implemented in Kafr Ghatati, Giza, Egypt in collaboration with KGACD, a local NGO. KGACD has a solid reputation in the local community, where it has implemented successful projects since 1998. This reputation helped to gain the confidence of the local community. During the project implementation, local volunteers and individuals comprised up to 95% of all the individuals who participated in the project.

- Management and supervision
  The local NGO has been involved in all the project steps since the outset. In the planning and initiation stage, they collaborated in preparing the proposal and defining the best factors to consider in the project. The KGACD representatives participated actively in the documentation, control and completion of the project. Currently, they are responsible for operation of the water treatment unit.

- Quality, resilience, and accessibility
  All the quotations that were received were analysed technically and financially to choose the best quality according to the available financial resources. Moreover, to ensure that water was accessible for those who needed it, water began to be delivered in reusable plastic containers.

Conclusion
The SWI has shown how higher education institutions can play an active role in the development of local communities. Moreover, the funding allocated for the developmental and community projects was used as a tool to develop and strengthen the leadership capacities of university students. Initiatives like this help universities to go beyond teaching and research responsibilities and achieve their third mission by having a greater impact on the community (Laredo, P. 2007). From a broader perspective, the SWI shows how developing-developed collaboration in developmental projects is a win-win partnership. The developed countries can involve their university students in real-development projects so that they can develop their leadership skills, and the developing countries can find solutions to pressing challenges through up-to-date technologies, well-researched projects and funding. Finally, it has been observed that these initiatives help to equip students with skills such as proposal writing, planning of marketing plans, people management, finance and logistics. Furthermore, they provide an opportunity to gain interpersonal skills such as negotiation, management and teamwork in a multicultural environment.

Acknowledgments
I would like to thank Allan Donald Mackie, PhD, lecturer in chemical engineering at the Rovira i Virgili University (URV) for his advice and guidance. I would like also to thank Joan Fuster and Inés Solé from URV Solidària for their help and support.

References


Abstract
Responsible Futures is a whole-institution supported change framework for embedding social responsibility and sustainability across the formal and informal curriculum pedagogically and integrated into content. It provides a framework to create an environment for staff and students to work together to embed sustainability into teaching and learning. The programme encourages institutions and students’ unions to identify opportunities to prepare future leaders across many disciplines with the knowledge, skills and attributes required to address global and local challenges, such as those broken down thematically in the United Nations’ Sustainable Development Goals (SDGs).

This paper provides an overview of the programme’s development, key learnings and insights from the last five years, as well as future plans for growing the reach and increasing the impact of Responsible Futures.

Background and Context
Universities, colleges, and students’ unions across the UK are increasingly examining how they take action for the United Nations’ Sustainable Development Goals (SDGs) for 2030. There is also significant demand from students for greater inclusion of sustainability, in its broadest sense, in all areas of their learning experience to ensure they are equipped with the necessary knowledge, skills and competences to work towards a more sustainable future (NUS, 2019a).

In 2014, in response to demands from students, the sector and professional bodies, the National Union of Students of the United Kingdom (NUS) launched the NUS Responsible Futures programme. This supported change framework and accreditation mark help tertiary education providers to meet the need for education change and students’ desire to get involved. Responsible Futures is a whole-institution framework for embedding social responsibility and sustainability across the formal and informal curriculum pedagogically and integrated into content. It provides a framework to create an environment for staff and students to work together to embed sustainability into teaching and learning. The programme highlights and encourages partnerships, to identify opportunities to prepare future leaders across many disciplines, with the knowledge, skills, and attributes required to address global and local challenges, such as those broken down thematically in the SDGs.

1. Partnerships refer to a university or college and their students’ union.
The Responsible Futures programme was designed on the premise that society needs more sustainability-oriented leaders who understand the complexity of the social, environmental and economic challenges that humanity faces (NUS, 2018a). A wealth of literature calls for such leaders. There is a need for what can be described as more ‘earth-literate’ leadership (Martin and Jucker, 2015). In fact, we could argue that society is experiencing a deficit in the capacity of government, civil society and business leaders to tackle the world’s greatest challenges. Furthermore, we could place the blame for this shortfall on universities. Universities educate future leaders, yet when we look at most of today’s presidents, prime ministers or chief executives, it is apparent that their university experience failed to focus their understanding of the world on sustainability. UK universities have a global responsibility for the education of world leaders, with 57 of all prime ministers, presidents, and monarchs having studied at a UK higher education institution (Hillman, 2018). As public institutions, universities have a moral obligation to act on behalf of the public good and in society’s best interest. They must do so by educating future leaders who will be adept at solving the world’s greatest challenges, rather than worsening them. Worldwide, just 6% of people attend university, but these individuals make up 80% of the world’s leadership positions (Hopkins, 2018). To ensure that the privileged global minority who attend university graduate with the ability to be positive agents of change, universities need to deeply, radically embed sustainability through their operations of teaching, learning and research (Alabaster and Blair, 1996; Martin and Jucker, 2005).

Responsible Futures is now delivered by Students Organising for Sustainability UK (SOS-UK), the National Union of Student’s new independent sustainability charity. It was launched in October 2019 and forms a key part of the NUS vision “to see more students learning about and leading on sustainability”. The framework was developed to help institutions in partnership with their students’ unions to identify the changes that are needed to embed education for sustainable development (ESD) in all spheres of the curriculum (formal, informal and subliminal). It legitimises and mainstreams education for sustainable development, and ultimately helps to ensure that students leave education with the knowledge, skills and attributes needed to create a more just and sustainable society. With education for sustainable development as the conceptual framework for Responsible Futures, SOS-UK have adopted the UK definition, shaped by the former Higher Education Academy (HEA), which is now Advance HE, and the Quality Assurance Agency (QAA):

“The process of equipping students with the knowledge and understanding, skills and attributes needed to work and live in a way that safeguards environmental, social and economic wellbeing, both in the present and for future generations”

(HEA, 2014)

Education for sustainable development has been widely recognized and is increasingly mainstreamed internationally as a result of the UN Decade of Education for Sustainable Development (UN DESD) and the specific inclusion of education for sustainable development in Goal 4 of the SDGs. Goal 4 sets out the aims for quality education and sub-target 4.7 outlines the aims for education for sustainable development and global citizenship education. Through active engagement with Responsible Futures and adoption of the framework for transformational change in how education is delivered pedagogically and in terms of content, we are seeing increasing numbers of higher education institutions in the UK integrating sustainability and therefore addressing the SDGs in their ways of working.

Student Demand

The work of SOS-UK (formerly the NUS Sustainability team) is led and informed by students. Responsible Futures was born out of the needs and demands of the sector and professional bodies, and the demands of students. For ten consecutive years, the NUS and now SOS-UK have been surveying students studying in the UK to better understand their attitudes towards learning for sustainable development. Since 2010, most respondents have consistently stated that they want their institutions to be doing more about sustainability (see Figure 1 below). Therefore, the programmes and campaigns led by SOS-UK are shaped to meet these demands.
Based on NUS research, we know:

- 80% of students think sustainable development should be a priority for their institution.
- 70% of students think sustainable development should be incorporated within courses.
- 65% of students want to learn more about sustainable development (NUS, 2019a).

The survey data represents a broad student base as the questions were included in a general student skills survey to avoid a bias response rate from students who are predominantly engaged in sustainability. Many Responsible Futures partnerships use these surveys to obtain a baseline of their students’ attitudes towards and experience of sustainability at their institutions and in students’ unions. This then enables changes in student perceptions to be tracked as partnerships achieve change aligned with the Responsible Futures framework.

Other student research data that has informed the framing of and developments in Responsible Futures is a 2017-2018 study by the NUS that further demonstrated students’ interest in the SDGs. Although 67% of students had never heard of the goals, when they were told about them, 61% stated that they would like the opportunity to learn more (NUS, 2019b). Since 2014, the NUS has been tracking tertiary education students’ concerns about climate change. Over the past five years we have seen concerns significantly increase from 76% (April 2014) of students who are very or fairly concerned to 91% in March 2019 (NUS, 2019c; see Figure 2, below). The data is aligned with that from the UK Government Department for Business, Energy and Industrial Strategy (BEIS, 2019), which demonstrates the growing need for our education systems to equip students and potential future leaders with decision-making knowledge, skills and competence to address this wicked global challenge and to reduce ever-growing concerns about climate change through societal change.

The Framework

To try to facilitate such a radical transformation within a risk-averse sector like higher education, the Responsible Futures supported change programme was created in 2014 (NUS, 2018a). Responsible Futures aims to transform our institutions through strong partnership working and cohort learning. Student voice and leadership is a key element of the programme. The students’ union is an equal partner to the institution in the decision-making and change process to achieve Responsible Futures accreditation, following the change framework outlined in an online toolkit.

The programme uses a supported framework approach to work with higher education institutions to strengthen their partnership with students’ unions and implement a range of top-down, middle-out and bottom-up interventions through a joined-up approach. The framework helps the partnership (the students’ union and the university) to work through a set of 45 criteria describing a range of education for sustainable development actions, with the dedicated support of SOS-UK and the wider national cohort of other participating partnerships. The actions outlined in the criteria are tracked, recorded and evidenced through an online toolkit and audited every two years. The audit process takes stock of what the partnership has achieved and encourages a culture of continuous improvement. Students, in their roles as auditors, play an integral part.
in the audit process. Over the course of two days, a team of students, typically between six and ten, from within the institution volunteer as auditors. They are responsible for reviewing evidence, interviewing staff and conducting focus groups. These audits are facilitated by SOS-UK staff members (the ‘trainers’) but are mainly led by the students. The programme cycle for Responsible Futures is shown in Figure 3 below.

![Figure 3. Responsible Futures programme cycle](image)

This is a multi-faceted change and intervention framework that has three levels of change, in recognition of the mass transformation required to achieve the embedding of holistic education for sustainable development at institution level:

- **Top-Down**
  - Changes in policy and strategy
  - Implementation of requirements for education for sustainable development in (re)validation processes
  - Introduction of new graduate attributes

- **Middle-Out**
  - Support for staff innovation (e.g. funding for teaching and learning)
  - Professional development opportunities for staff
  - Fostering of stronger working relationships between the students’ union and the institution

- **Bottom-Up**
  - Engagement of students and staff in collaborative discussions
  - Student campaigns for change on their course
  - Course reps championing education for sustainable development in student-staff meetings

Criteria within the Responsible Futures toolkit have been deliberately shaped to distribute responsibility for this change process across all levels of the partnership as a means of optimising the potential results and impacts of working towards an integrated model for sustainability learning and practice. The criteria are drawn from good practice across the sector. SOS-UK works with partnerships to personalise their approach by selecting criteria that suit them, including developing some of their own criteria. There are eight themes under which the criteria have been categorized to provide a framework that is underpinned by continuous progress, reflection, evaluation and monitoring of the impacts of both strategic change and on-the-ground initiatives and activities.

The actions recognise that a one-size-fits-all approach is ineffective and therefore are designed to be customisable and flexible to suit different priorities, institutional cultures and circumstances. The programme provides a framework and road map for partnerships to assess and benchmark their work, guide and shape their future efforts and recognise their existing accomplishments.

**Responsible Futures Criteria Overview**

1. **Baselines and benchmarks.** Gaining an in-depth understanding, knowledge and familiarity with education for sustainable development across the partnership
2. **Partnership and planning.** How the partnership works to achieve Responsible Futures accreditation
3. **Leadership and strategy.** Institutional leadership and gaining buy-in through statements of support and strategy
4. **Policy and commitment.** Committing appropriate resources to the agenda and aligning this with existing processes
5. **Interventions.** Specific interventions used to engage students and staff
6. Impacts and outcomes. Reflecting on the impact and outcomes of strategies and activities

7. Outreach. Sharing what the partnership has done with others

8. Self-defined criteria. Highlighting unique good practices and campaigns

To achieve the accreditation mark, the partnership must meet or exceed the score threshold of 200 points, out of the maximum 300 points, not including the three self-defined criteria. There are 45 criteria in total: 10 are mandatory, 35 are optional and you can write 3 yourself (self-defining criteria). Partnerships must complete the mandatory criteria to gain accreditation.

When ready, partnerships are audited by a team of their own students, who are trained and supported by SOS-UK over the course of two days. This process results in an externally verified audit. Accreditations are awarded and remain valid for two years. On day one of the auditor training and audit, students are trained to understand organization change theory and what education for sustainable development could look like in practice, so that they can effectively review and evaluate the documentary evidence submitted by the partnership. Day two of the audit involves training the students to give interviews, in preparation for them to lead on interviews with key staff and officers from the institution and students’ union as a means of gaining a deeper understanding of the work, efforts and narrative behind achieving Responsible Futures accreditation.

An annual bespoke support day is available for all partnerships, facilitated by SOS-UK, in addition to regular catch-up calls. In 2019, a Host Partnership scheme was launched to encourage greater knowledge exchange and peer-to-peer support across the cohort of participating partnerships. The three successful host partnership applicants for 2019-2020 were the University of the West of England (UWE) and the student’s union at this university, Anglia Ruskin University and its student union, and Keele University and its student union. These partnerships come forward to lead on sharing their positive and negative experiences of putting Responsible Futures into action over the past five years, and how we can reflect on and learn from this to improve together in the future. The Host Partnerships provide national support days, workshops, webinars and a model for mentoring.

Case Study: Anglia Ruskin University and Students’ Union

Anglia Ruskin University has over 30,000 students studying online and at campuses in Cambridge, Chelmsford, Peterborough and London. In its 2009 Corporate Plan, it stated that “sustainability will be a feature of all our students’ experience”. Since then, the university has been actively embedding sustainability in its curriculum. It has been Responsible Futures accredited since 2016 and has a 2019-2020 Responsible Futures Host Partnership. The university is catalysed by a dedicated team of academic staff outside faculty structures, who work across the university and alongside centralized professional services such as quality assurance, student services and employability as well as with their student union and societies. This organizational structure has been important in ensuring sustainability is not seen as ‘part of’ or ‘owned’ by any particular discipline but instead as an approach to learning and teaching that supports and enhances the university’s learning and teaching goals.

One example of this is the framing of a new set of modules by the UN’s Sustainable Development Goals. These so-called ‘Ruskin Modules’, which will be compulsory for almost all undergraduates by 2022, aim to “creatively develop the capacity for critical reflection and reasoned argument, integrating the acquisition of graduate capitals with wider societal concerns and challenges, bringing together students from different disciplines around key challenges” (Anglia Ruskin University, 2018).

The essential requirement for interdisciplinary approaches to address the complexity of sustainability mean that using the SDGs as a framework requires students to engage in interpreting and integrating ideas and methods from fields that may previously have appeared unrelated, and to think in systems, recognising connections beyond their own discipline. This ensures the modules will meet the learning and teaching goals of broadening perspectives, developing intellectual flexibility and encouraging the creative capability to address challenges in collaboration with others.
Five Years of Responsible Futures

In 2014, the programme was launched as a pilot of 13 partnerships that all contributed to the shaping and development of the Responsible Futures framework and accreditation mark. The 2014-2015 pilot partnerships represented further education and higher education institutions and students’ unions across the UK and the advisory board was comprised of various sector organizations including People and Planet, the Association of Colleges, EAUC, EAUC-Scotland, Learning for Sustainability Scotland, University and College Union, Society for the Environment, Higher Education Academy, Knowledge Transfer Network, a selection of academics and the NUS Sustainability Direction and Oversight Board.

In collaboration with one of our 2019-2020 Host Partnerships, SOS-UK are now in the process of reviewing and assessing the learning, actions taken, practices and developments from the last five years. The full review will be available late summer 2020.

To date, the NUS, and now SOS-UK, has supported over 30 tertiary education institutions and their students’ unions through Responsible Futures. This represents over 520,000 students. A total of nearly 800 actions have been taken to integrate sustainability into the work and offerings of partnerships, so that they can advance in their contributions towards the SDGs locally, nationally and internationally. The outcomes of these actions are summarized in the table below:

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<th>University of the West of England</th>
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<th>University of York</th>
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Reflecting on gaining accreditation, partnerships have said that the value of achieving the Responsible Futures accreditation is to:

- Secure credibility, internally and externally
- Develop a reputation for excellence
- Enable access to funding
- Develop new working links within the university/college
- Create better partnerships between the institution and students’ union
- Enable engagement of staff, at multiple levels and roles, in embedding sustainability
- Secure the incorporation of education for sustainable development into high-level strategy
- Embed education for sustainable development across the formal and informal curricula

On the programme overall, partnerships have reported that Responsible Futures has driven new activity; benchmarked progress and facilitated reflection; developed new, strong working relationships across the institution; and engaged and empowered staff to take action.

The Audits and Student Experience

Feedback from institutions, students’ unions and student auditors tends to be positive (NUS, 2018a). When the programme was initially designed, the audit component was focused almost entirely on determining the accreditation level of the partnership. This focus was functional, with student learning being seen as an important, but secondary, focus. Today, the audit is essentially focused on being a high-quality student learning experience. The output of determining accreditation is an important, but secondary, focus. This transformation over time has happened organically, based on the feedback of staff and students involved and on the experiences of trainers delivering the audits.

“A great experience for all involved, it has been incredible to take part in this, and I am very proud of the university and the students’ union at UWE.”

Responsible Futures student auditor at the University of the West of England (UWE), March 2016.
Student auditors consistently report that they found the experience of the training and auditing either ‘very useful’ or ‘useful’. Likewise, following the training, all students to date have stated that they felt ‘very confident’ or ‘confident’ to conduct the audits following their training. The process students go through to be prepared for and then deliver the audits has been summarized by the students themselves as:

“Mesmerising and life changing, by gaining insight and knowledge of what other institutions are doing for sustainability” (student auditor, 2020).

“A great experience, you learn lots of useful tools” (student auditor, 2020).

“An invigorating and fun exercise with a well-structured programme that proved to be extremely interesting and insightful” (student auditor, 2019).

“Great experience! Genuinely inspiring to see the amount of ecologically positive intent and work the university had put into gaining the accreditation, which I wouldn’t have known otherwise” (student auditor, 2018).

“A must for all students of today’s higher education institutions” (student auditor, 2020).

Five Years of Responsible Futures

Responsible Futures is now a well-established and highly regarded programme in the UK. At a similar stage, the National Union of Students’ other sustainability programmes have successfully moved into international programmes, including Student Switch Off that runs across six European countries and Green Impact that runs across Europe and Australasia, with a planned pilot in the USA.

In partnership with the International Association of Universities (IAU), SOS-UK is launching an international pilot for Responsible Futures in Spring 2020. SOS-UK and the IAU will seek to work with the Committee of Ten successful pilot applicants in the first year of the pilot. With at least one partnership per continent, the international cohort will work with SOS-UK and IAU to co-design the international Responsible Futures framework and rework criteria to ensure it is relevant and an appropriate fit for an international audience. For more information on this, please contact responsiblefutures@nus.org.uk.
Student Initiatives to Achieve Gender Equality in Haryana, India: A Case Study from Bhagat Phool Singh Women’s University

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Abstract
The present paper is a study of the importance of university-community engagement and the role played by students in social work to address issues related to gender inequality in the adopted villages of Bhagat Phool Singh Women’s University (BPSWU). While many efforts have been made at the international and national levels by various stakeholders including governments, non-governmental organizations, local communities, funding organizations, public policymakers, UNFPA, UN Women and many others to achieve the objectives of the SDGs related to gender equality, there remains a great deal more to do. Limited research conducted on university-community engagement has revealed that most universities keep within their own four walls and pay little attention to the development of society at large. As a result, students attain degrees that are detached from social realities and they make no effort to solve societal problems. In this context, the present paper highlights initiatives undertaken by the students of BPSWU to combat issues related to gender inequality. The study is descriptive and qualitative in nature. The study also discusses the students’ impact on the community as a whole and how women have empowered themselves socially, politically and economically. Lastly, the study suggests measures that can be pursued to motivate students to take part in university-community engagement.

Introduction
In order to achieve Goal 5 of the Sustainable Development Goals (SDGs), which focuses on gender equality, it is imperative that women should be free from violence and discrimination. This is also a prerequisite for the economic and social development of any country. According to UNICEF, gender equality “means that women and men”, and girls and boys, enjoy the same rights, resources, opportunities and protections. It does not require that girls and boys, or women and men, be the same, or that they be treated exactly alike (2014). Though many efforts have been made to achieve gender equality under the Millennium Development Goals (MDGs), there remains a great deal more to do in combating the problems of gender discrimination and violence in every part of the world. It is unfortunate that no country has fully achieved the promise of gender equality envisioned in the ambitious 2030 Agenda, according to the gender index for each of the 195 countries (Equal Measures 2030). Research continues to show that 1 in 5 women and girls between the ages of 15-49 have reported experiencing physical or sexual violence by an intimate partner within a 12-month period and that 49 countries currently have no laws to protect women from domestic violence. Globally, 750 million women and girls were married before the age of 18 and at least 200 million women and girls in 30 countries have undergone female genital mutilation.
Gender Inequality in India
In India, deep-rooted patriarchal norms and unequal power relationships between men and women are the stumbling blocks that perpetuate gender-based violence and discrimination. According to the UNDP report (2019), India ranks 132 out of 187 countries on the gender inequality index (GII). One of the major reasons for the country’s low ranking is its skewed ratio of only 914 females for every 1,000 males, according to the 2011 Census (Government of India). In addition, the UNDP report found that only 29% of Indian women above the age of 15 in 2011 were part of the labour force, compared to 80.7% of Indian men. In the Indian parliament too, only 10.9% of lawmakers are women. The United Nations Population Fund stated that “despite many international agreements affirming their human rights, women are still much more likely than men to be poor and illiterate. They have less access to property ownership, credit, training and employment. They are far less likely than men to be politically active and far more likely to be victims of domestic violence.”

Higher Education Institutions and Community Engagement
The interface between universities and society has been gaining importance in recent years at the international and national levels. The role of universities has been internationally accepted as serving three aims: teaching, research and serving society. Higher education institutions (HEIs) have a vital role to play in solving the social and economic problems of society. One of the ways that universities can serve society and even help to ameliorate social problems is to adopt the practice of community-university engagement. When students under the guidance of faculty leave the classroom to work on community engagement, not only does it broaden their horizons but also society as a whole realizes its indigenous knowledge to solve problems that have long been ignored. UNESCO’s Second Conference on Higher Education (2009) mentions that HEIs should mainstream indigenous knowledge and promote social responsibility. A recent World Report by the Global University Network for Innovation (GUNI, 2013) has emphasized that universities should promote new types of teaching and research for societal development.

The importance of community engagement has recently been recognized in India. In accordance with the recommendations of the Steering Committee on Technical and Higher Education, the 12th Five-Year Plan of the Government of India aimed at promoting greater social responsibility in higher education in the country. The University Grants Commission, the highest body responsible for regulating higher education in India, has rolled out a scheme to establish a centre for fostering social responsibility and community engagement in every university. The main objective of the scheme includes the promotion of community-university partnerships to develop knowledge that will improve the lives of people and encourage participatory research.

Objectives of the Paper
Given the above context, the paper has three objectives:
1. To describe the initiatives undertaken by students in social work within the BPSWU’s adopted villages under the category of innovative practices of community engagement related to gender equality.
2. To ascertain the impact of community engagement programmes on rural women.
3. To provide suggestions for effective student participation in community engagement.

Methodology
The study is based on intensive field work done by students in the Department of Social Work at BPSWU. Field work is the heart and soul of the social work profession. For two days a week, students go to the adopted villages of BPSWU to practice their classroom teaching and conduct activities for the welfare of the community. The study is descriptive and qualitative in nature. Both primary and secondary data have been used. In addition to interviewing the president of the village, the field work included focused group discussions with community-based organizations, such as self-help groups, youth clubs and other important stakeholders, in order to understand their role and any impact that they have noticed in the wake of the students’ intervention.
Brief Description of the Area of Study

This study was conducted at Bhagat Phool Singh Women’s University (BPSWU), located in Kharapur Kalan, Haryana. BPSWU is the first residential state women’s university in the northern part of India to provide education from kindergarten to doctoral studies. Addressing gender disparity lies at the heart of BPSWU’s mission and its engagement policy, which states that women should contribute to the advancement of their communities and that the university should raise the status of women in society by producing strong leaders. It is important to mention here that BPSWU is the first and only university in India to set up a Centre for Society-University Interface and Research (CSUIR) in order to bridge the gap between the university and society. As far as Haryana is concerned, it is one of the fastest growing states in India. However, while Haryana’s economic growth is significant and its per capita income is the highest in India according to the Economic Survey of India 2015-16 (Ministry of Finance, 2016), the state nevertheless has a dismal record on gender issues.

Innovative Practices of Community Engagement Initiated by Students

Below is a description of five innovative activities implemented by students in social work to achieve gender equality in BPSWU’s adopted villages.

1. Establishment of community resource centres in collaboration with village councils

While many schemes and programmes are implemented by central and state governments from time to time in order to bring marginalized sections of society into the mainstream, a lack of awareness and participation means that these schemes and programmes are not accessed by everyone in a village. In addition, there is no platform in villages where people are notified of the detailed information and procedures required to gain benefit from these schemes and programmes. As a result, the benefits go only to those who are aware of them and who are close to the head of a village council.

Keeping the above context in mind, students under the guidance of their teachers set up a community resource centre (CRC) in each adopted village in collaboration with the village council. With the help of the CRC, BPSWU students took the initiative to inform, educate, communicate and advocate for various schemes and programmes related to women’s development. Students made effective use of posters, charts, rallies and other means of public awareness-raising to provide information on the various schemes and programmes for deprived sections of society. Students also performed traditional role plays (Nukkad Natak) to raise awareness about the process for gaining benefit from the schemes and programmes and they arranged extension lectures by banks, rural development organizations, women and children departments and other bodies to bridge the gap between officials and the community at large.

2. Formation of self-help groups to promote micro-enterprises

Both research and rural realities support the need for self-help groups (SHGs) to empower rural women. Given the importance of SHGs in the lives of women, the students organized awareness camps for the formation of SHGs in collaboration with the District Rural Development Agency in Sonipat and the National Bank for Agriculture and Rural Development. Students were also instrumental in conducting monthly meetings of the SHGs and opening their accounts at the bank. As Haryana is known for its milk, card and cattle raising, women showed interest in receiving training in dairy farming. Students facilitated their efforts by organizing a ten-day training programme on dairy farming and vermicomposting in collaboration with Punjab National Bank and the Rural Self-Employment Training Institute in Sonipat, Haryana. After the training, students also helped the women to secure a loan from the bank to start innovative income-generating activities.

3. Open defecation free village

Goal 6.2 of the Sustainable Development Goals (SDGs) is to achieve access to adequate and equitable sanitation and hygiene for all and to end open defecation by 2020 by paying special attention to the needs of women and girls and those in vulnerable situations. During the field work, students observed that a lack of household toilet facilities forced many women to walk long distances from their homes to find private open places to defecate. In order to combat this problem, students organized a one-day workshop on sanitation and the open free defecation village initiative in collaboration with the District Rural Development Agency (DRDA) in Sonipat.
Haryana. The aim of the workshop was to make villagers aware of the harmful effects of open defecation and its impact on their health.

4. Political participation of women

The Constitution of India provides women equal rights with men. It is unfortunate, however, that rural women are mostly unaware of their rights because of illiteracy and an oppressive tradition. There is no denying the fact that after the 73rd and 74th constitutional amendments, women have started entering the mainstream and holding leadership positions. It is in this context that the Department of Social Work celebrated National Voters’ Day in BPSWU’s adopted villages in order to raise awareness among rural women about the importance of voting in their lives. In addition to lectures, efforts were made to raise awareness through a poster-making competition and the viewing of a documentary movie on the importance of voting in the adopted villages.

5. Prevention of child marriages

According to the Global Childhood Report released by the UK-based NGO Save the Children India, the prevalence of child marriage is higher in rural areas than in urban areas. In view of the severity of the problem, a study on the awareness and prevention of child marriages was conducted in collaboration with the Young Women’s Christian Association (YWCA) in BPSWU’s adopted villages. The study was followed by regular meetings with the main stakeholders in the villages to ensure that child marriages are averted and reported in a timely fashion. Faculty and students also raised people’s awareness of the hardships of early marriage.

Impact on the Community after Student Interventions

The community impact of the interventions made by the students in social work is praiseworthy. It was observed that the involvement of faculty and students brought people together to deliberate in their CRCs on pertinent issues like the declining sex ratio, the formation of SHGs, the reduction in water wastage, domestic violence, ill effects from the burning of plastics, etc. One of the important changes found after the BPSWU intervention is that there is a positive change in the mindset of parents toward sending their daughters for higher education, when previously they were not very interested and instead washed their hands of their daughters by marrying them off at an immature age.

Secondly, Haryana is known for its agriculture, it is considered a land of milk and butter, but the condition of women and girls is not good. The declining sex ratio is one of the areas that needs the greatest attention. Since the intervention, women now welcome the birth of a girl child. In addition, families as a whole come forward to gain the benefits of schemes and programmes that promote girl children. With the establishment of the CRCs, women reported that they now receive all the information on documents required to gain benefit from schemes directly at their doorstep, whereas beforehand they had never got them from government offices, even after running from pillar to post. After conducting focused group discussions with rural women, it was also found that women discuss their issues pertaining to village development at the CRC before raising them in the village council. These centres have proved instrumental in bringing a marginalized section of society into the mainstream.

The training programme on dairy farming and vermicomposting made a positive impact on women, bringing most of the women out of their homes for the first time and building their confidence when interacting with bank officials to secure loans. Most of the women said that the SHGs have an important role to play in shaping and developing their personality.

Organizing the workshop on toilet construction yielded fruitful results. By sharing their experiences, women found that the days when they once faced a great deal of shame and difficulty in searching for a suitable place to defecate in open places were gone and they no longer had a fear in the back of their minds that they were being watched by men. The construction of toilets also helped in stopping violence against women in the villages.

Bearing in mind the culture and traditions of the villages, women’s participation in local governance was bleak. However, after the students’ intervention, women realized the importance of voting and stepping forward to hold leadership positions in the village. The impact of regular meetings and the formation of adolescent groups instigated by the students helped not only in the identification of families where child marriage has occurred but also in timely reporting for its prevention.
Below are several suggestions to encourage effective student participation in community engagement.

1. Student-initiated community engagement work (including internships, fellowships and coursework) should be encouraged.

2. Universities should be given autonomy to make their programmes, courses and initiatives more relevant to the needs of society.

3. New training/awareness programmes for students and faculty members may be developed in higher education institutions to replicate the activities of community engagement and build a community engagement model for other universities in India and abroad to follow.

4. New curricula and courses, short-term workshops, and certificate and degree courses for students should be designed and developed.

5. Integrating social responsibility in the curriculum and pedagogy of syllabuses, courses and programmes being offered by universities is one of the steps toward achieving community-university engagement.

6. Best practices in community engagement need to be identified in order to disseminate them among higher education institutions for the benefit of the academic fraternity and the society at large.

7. Special funding should be earmarked for community-university engagement for the purpose of conducting good research. Not only funding but also the availability of adequate facilities and excellent human resources are needed to make the community-university bond stronger.

8. Partnership programmes, such as student mobility, joint research, joint publication and staff exchanges with other universities, where both teachers and students can learn from best practices and implement them in their respective universities, are another step toward making community-university engagement interesting and involving.

Conclusion

It is high time that universities respond swiftly and appropriately to the changes that are now taking place as a result of rapid development and other shifts. It is an undeniable fact that universities have great potential through their faculty and students to achieve the goals of gender equality in a holistic way through their core missions: teaching, research and extension activities. The present need is to call for cooperation and coordination among various stakeholders in order to overcome the challenges faced by women today. In order to bridge the gap between universities and communities, non-governmental organizations and civil society can play a vital role. A major responsibility rests on the shoulders of teachers who can motivate students to work for the betterment of our society and make them aware of social realities from the local to the global as well as their role and responsibilities in a changing world that most of them do not care about. To achieve the SDGs, it is imperative that all stakeholders must be ready to collaborate. Only in this way will the results be equitable, effective and sustainable. There is a dire need for the whole-hearted commitment of people to work toward community improvement. They may prove instrumental in building the capacity of members of the community and they can also represent the interests of all sections of society. In order to bridge the gap between university and society, it is necessary to integrate the knowledge of theory and practice. Only with this kind of integration, which is an urgent task for higher education institutions, can there be a positive revolution in human capital.

References


Abstract
Cities are facing colossal challenges due to the impact of global climate change and rapid population increase. Their transformation will play a major role in attaining sustainable development and the sustainable development goals (SDGs). The focus should be to strengthen cities’ economic, social and environmental capacities. This study is the result of the degree course in Architecture and Sustainable Development at Cairo University and an extracurricular collaboration between Cairo University, the University of Bologna and the University of Trento, involving a group of master’s degree and final year students. The objective of the study was to revitalize an abandoned site and factory area in Conegliano, Italy, to transform them into an educational centre and to be a hub for sustainability. Sustainable development principles and SDGs were implemented through innovative solutions and smart technologies to transform the site and an old building to be sustainable, resilient and liveable and to create a green, sustainable place for learning in the city. The planning philosophy was centred on architectural and urban farming innovation. Many smart solutions were used for the façades to turn this building and site into a live hub. The newly developed site and buildings include a research centre that was created so that higher education students can learn and practice innovation in urban agriculture and reduce energy use and CO2 emissions. A mobile application was used to enhance the self-learning experience. A business model, covering the strategy, SWOT, operation costs and a feasibility study, was developed to report on the project’s revenue and to reduce the city’s unemployment rate. The results indicate that integrating agriculture and architecture using smart technologies could lead to economic growth and social integration and achieve liveability. The new site had a range of users and mixed activities with nature were offered. Therefore the project met SDGs 4, 6, 7, 8, 9, 11, 12, 13, and 17.

Introduction
The world is suffering from humans’ past irresponsible actions that have resulted in climate change, poverty and health crises, which threaten future generations’ lives. In response, the United Nations’ Agenda 2030 establishes 17 Sustainable Development Goals (SDGs), 169 targets and 230 indicators to be applied (United Nations 2016; 2020). It is time to take serious steps and real action towards robust sustainable development and SDG implementation. The UN stated that “SDGs are the World’s best plan to build a better globe for people and our planet by 2030” (United Nations 2016; 2020). Thus, SDGs are a call for action by all countries to promote prosperity while protecting the environment.

Transformation of an Abundant Site to be a Green Education Hub, Achieve SDGs, and Adapt to Climate Change in the City of Conegliano, Italy
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Higher Education and Sustainable Development

To end poverty and hunger and ensure quality education, we need strategies that build economic growth and address a range of social needs, including good education, health, equality and job opportunities, while tackling climate change and working to preserve our ocean and forests (United Nations 2016; 2020). All public and private institutions worldwide, as well as communities and most importantly education institutions, are responsible for taking the lead and actively participating in SDG implementation. Education is a key platform to spread awareness about sustainable development and support communities through teaching how to achieve the SDGs, protect cities and ensure a sustainable future. Correspondingly, solutions must be reached to reduce the consumption of global natural resources, increase clean production and mitigate global CO2 emissions by exploiting renewable energy.

This study addresses the role of education in community transformation to attain sustainable development and the SDGs. The main concept is the use of urban farming combined with education to generate clean food production and green areas in the city and to cut energy use and emissions. Such initiatives also provide services and job opportunities for the community to become socially, environmentally and economically sustainable.

Given its primary role as knowledge producer, higher education can serve as a powerful platform and significant resource to help create a more sustainable future. In recent years, the concept of education for sustainable development has become one of the core educational initiatives to help address many of the problems associated with human development. According to UNESCO, education for sustainable development “empowers people to change the way they think and work towards a sustainable future”. Therefore, it involves making access to good quality education available at every stage of life (UNESCO 2016; 2020). More specifically, it involves educating students on the necessity of sustainable development by integrating sustainable development issues into all aspects of teaching, research and service. This means reorienting the education system at all levels to help people think and behave in ways that foster a more sustainable planet (for example, global citizenship, recycling, climate change, biodiversity, renewable energy and social responsibility). In practice, it means equipping students with the requisite knowledge, skills, attitudes and values to create a sustainable future. To that end, students should cultivate critical and creative thinking skills, engage in authentic interdisciplinary learning activities and develop a value system that emphasizes responsibility to self, others and the planet (Blessinger et al., 2018).

Higher education institutions are currently focusing on sustainability and social responsibility (SSR). At Oxford Brookes University in the United Kingdom, environmental sustainability is integrated and embedded in the operations, supported in teaching and research, and fundamental to overall commitment to social responsibility (Oxford Brookes University, 2020). In addition to programmes focused on sustainable development, urban sustainability and the environment, some student activities help them to think about the broader spectrum and contribute to a sustainable future. These activities include choosing sustainable modes of transport, saving energy in halls, enhancing local biodiversity, creating entrepreneurial solutions for recycling and participating in community action groups to be socially and environmentally engaged citizens (Oxford Brookes University, 2020).

At University College London (UCL), Education for Sustainable Development (ESD) is carried out quite differently. Their definition of ESD is mainly “the process of equipping students with the knowledge and understanding, skills and attributes needed to work and live in a way that safeguards environmental, social and economic wellbeing, both in the present and for future generations” (University College London, 2020). The UCL embeds sustainability in the curriculum in various programmes, most significantly the Living Lab Programme that uses the university campus and operations as a focus for research or study to tackle sustainability challenges by bringing people together to test new ideas. In addition, the UCL Circular Economy Lab (CircEl) is an exciting cross-faculty, cross-discipline initiative designed to use the university’s expertise to improve the design of buildings and products, their reuse and recycling, and the return of constituent materials to the economy (University College London, 2020). Table 1 summarises these two universities’ approaches.
Table 1: Sustainability and sustainable development implementation in UK universities

**Oxford Brookes University**

- Sustainability and social responsibility
- Environmental sustainability embedded in:
  - Operations
  - Teaching and research
  - Integral to overall commitment to social responsibility
- Programmes focused on:
  - Sustainable development
  - Urban sustainability & environment
- Student activities to think about the bigger picture and contribute to a sustainable future through:
  - Choosing sustainable modes of transport
  - Saving energy in halls
  - Enhancing local biodiversity
  - Building entrepreneurial solutions to recycling
  - Participating in community action groups to be socially and environmentally engaged citizens (Oxford Brookes University, 2020)

**University College London (UCL)**

- Education for sustainable development
- Sustainability embedded into the curriculum in various programmes:
  - The Living Lab Programme
    - Uses the university campus and operations as a focus for research or study to tackle sustainability challenges
    - Brings people together
  - The Circular Economy Lab (UCL CircEL)
    - Exciting cross-faculty and cross-discipline initiative to:
      - Use UCL’s expertise to improve the design of buildings and products
      - Reuse and recycling
      - Return of constituent materials to the economy (University College London, 2020)

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**Objectives**

This study was designed to achieve the following objectives (Figure 1):

- Explain global challenges that make sustainable development a crucial obligation that all entities around the world must apply
- Review and understand the effect of higher education on the application of sustainable development
- Illustrate some precedents and the current experiences of some universities around the world concerning the introduction of sustainable development (SD) in their programmes and extracurricular activities
- Examine how to embed sustainability and SDGs in higher education programmes
- Implement course learning about SDGs in a group-applied research project

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**Role of Higher Education Programmes in Fostering Sustainable Development Implementation**

**About the University and the Programme**

Universities could be the hub to drive sustainable development and SDGs. For example, Cairo University (CU, Egypt), has been the largest university in the country since 1908, and currently has over 262 thousand national students enrolled and 7 thousand international students.
in 26 faculties and institutions. The mission of CU is to enhance the learning process through interactive learning methods and modern information technologies. The university also attempts to serve the region and the world by providing an environment of creative inquiry that embodied critical thinking, human values and technical competence as well as practical and capacity building, social empowerment and skills. Furthermore, CU seeks to advance the intellectual, cultural and economic aspects of society, and to advocate for intellectual, cultural and economic integrity as well as online learning processes (Cairo University, 2020).

These missions are fulfilled within the faculties and institutions and are implemented fully at the Faculty of Engineering. The Architectural Engineering Department has various courses that address sustainability, such as environmental design, architectural design, urban design and planning according to contemporary standards and maintaining the community’s heritage. The aim of all these courses is to teach students practically through individual and group projects, to ensure their engagement in real-life experience. Most importantly, the course Architecture and Sustainable Development (ASD; ARC 383) for third-year students is on the sustainable development that is embedded in architecture and urbanism. The faculty has also focused on extracurricular activities, especially in the youth welfare sector, which is responsible for all student activities, social services and environmental contributions.

**The Course: Architecture and Sustainable Development, Spring 2018**

**ASD Course Outline**

The ASD course was first offered during spring semester 2018. It aims to introduce in detail the concept of sustainable development, the Sustainable Development Goals (SDGs) and how sustainable development is related to urbanism and architecture. It presents the main pillars of sustainable development and its six dimensions as well as green economy sectors as a tool to achieve sustainable development. The course also addresses and discusses sustainable development indicators and the role of architecture and cities in accomplishing SDGs, specifically SDG 4, 6, 7, 8, 9, 11, 12, 13, 15 and 17.

In addition, the course highlights the importance of sustainability of buildings and methods of evaluation to counterbalance climate change risks and meet sustainable development requirements. Moreover, it outlines the application of green features in the built environment and assesses building performance according to sustainable development pillars. The course also focuses on how to develop green buildings and to enhance existing buildings to support the sustainability of urban areas and the adaptation measures to fight climate change risks. Finally, it discusses how various functions of buildings can be reused and modified, so that they do not remain as white elephants and the SDGs are achieved.

**Course Objectives and Outcomes**

The main intended learning outcomes (ILOs) of the ASD course are illustrated in Figure 3. However, the details of each main ILO are listed below where by the end of the course, students should be able to:

**Knowledge and Understanding**

- Understand sustainability and sustainable development to develop a better future
- Learn the inclusive green economy sectors
- Understand the elements of sustainability and sustainable development to counterbalance climate change
- Increase awareness of various issues related to sustainability and green building
- Gain knowledge on sustainability and energy saving techniques to develop sustainable buildings

**Intellectual Skills**
- Exhibit knowledge of sustainability and sustainable development at global, regional and local scale
- Address issues related to sustainability, SDGs and sustainable building
- Integrate sustainable means of clean energy into buildings and urban areas
- Assess building performance and the use of sustainable materials and technologies to achieve energy efficient buildings within a sustainable built environment
- Demonstrate professionally how buildings/cities play a key role and support SDGs
- Exhibit innovation in the challenge project to meet sustainable development and SDGs

**Professional and Practical Skills**
- Develop means of communication and debates on aspects related to the environment
- Use analytical methods, gather data and evaluate various buildings for sustainability
- Solve related problems and develop solutions for sustainable urban areas to improve efficiency

**General and Transferable Skills**
- Manage tasks effectively within time limits and with the available resources
- Communicate effectively using appropriate display tools
- Search for information and refer to relevant literature

**Methodology**

The methodology of the applied group project in the ASD course depends on two main approaches: inductive (analytical) and deductive (applied) as shown in Figure 5.

**The GILGAMESH Project**

**Site**

The GILGAMESH project site is in the city of Conegliano, Italy (Municipality of Conegliano, 2019; University of Bologna, 2019). The site is not isolated from global challenges and is considered a black hole in the city, in terms of urban regeneration and climate change impacts.

**Issues and Challenges**

- Revitalization of the abandoned site and old, abandoned building (Figure 6);
- Transformation of the building to be productive and serve the community;
- Inefficiency in the adaptive reuse policy for this site, which has been abandoned for over ten years and is huge, with an area of over 165,000 m²;
- Lack of green areas and public spaces;
- Unhealthy food and pollution; and
- Urban population increase and high resources use (UrbanFarm, 2019)
PART II – Integrating Student Leadership in Sustainable Actions

Figure 6: The abundant site and old vacant building
Image source: http://www.site.unibo.it/urban-farm/en/location/conegliano-zanussi-area

Project’s Aims

The group project targeted five main objectives, summarized in Figure 7:

• Revitalize the abandoned site and ex-Zanussi factory to transform it into an educational centre and a hub of sustainability in the city;
• Transform the existing building so that it is sustainable, resilient and liveable;
• Create a green and sustainable site by utilizing innovative urban farm technologies (soilless solutions);
• Strengthen the city’s capacity economically, socially, and environmentally; and
• Re-energize the community.

Concept

The concept of transformation is used to underline the human potential to renovate the abandoned building and site and turn it into an educational facility for art and agriculture, combined through architecture.

Architectural Interventions and Innovation

The design has two main accesses from the north and south. The first entrance is for the art wing and passes through the art gallery and the art centre to reach the heart of the site, where a shared space and a restaurant are located, with an educational centre and labs overlooking the space comprised of the urban farming area with users’ activities. The southern entrance is defined by the greenhouse and an organic food market inside the building. This allows users to pass through the farming wing to observe, learn and get the experience of the entire farming process till they reach the brewery, where they can watch the beer production and taste the freshly brewed beer. A mobile application has been developed for users so that they can obtain information and enjoy a learning experience. Figure 8 illustrates the project plan in detail.
Many innovative, smart solutions and technologies were incorporated into the project building and urban farming, including:

- Ethylene tetrafluoroethylene (ETFE): a fluoropolymer is used for the roof and the imagination domes. The lightweight nature of ETFE means that its use in construction cuts CO2 emissions;
- The BYFUSION Blocker: this is a machine that transforms all types of plastic waste into high-tech building blocks (The Blocker);
- Rainwater harvesting: the potential of the building’s façades are used as the biggest possible surface to collect rainwater (Victoria Hammel);
- Bioluminescent algae: phosphorescent algae can provide natural light during the night. They can improve air quality and reduce greenhouse gases. In addition, they could be used to clean industrial wastewater;
- LED lighting: well-known for their efficiency, which translates into energy savings for both the consumer and the operator;
- Lucid energy: LE was installed in the water pipes of urban farms to generate power;
- ES pipe technology: used to add more clean energy (The Tech Journal); and
- Green flexible partition system: exploited to divide internal spaces more sustainably and to manage resources (Movisi).

Urban Farm Design

Agriculture activities are performed indoors using a hydroponic vertical system known as ZipGrow. This is a vertical hydroponic system that is best suited to continuous production throughout the year and can easily be relocated whenever necessary. The outdoor area is used to grow a wide range of local fruit and flower varieties and there is a specific area for hop production. A microbrewery has been established using traditional materials and local fruit and hops, which contribute to the uniqueness of the products. The mushroom factories use the by-product of the brewery process in an integrated way that is designed to decrease the cost and limit waste. Figure 9 presents the flow of the Urban Farm process.

The Project, Sustainable Development Pillars and SDGs

Based on a SWOT analysis, an economic feasibility study and the business model, the site was transformed to meet sustainable development pillars and SDGs, and to create a centre for social innovation in the city, as shown in Figure 10. In the outdoor area, the educational route for visitors and students is marked, as well as the urban farm areas and gardens. Figure 11 shows a general view of the combination of agriculture with architecture, whereas Figure 12 presents the innovations and technologies used in the sustainable project. Table 2 also lists the assessment of sustainable development pillars and SDGs in the project.
Results and Discussions

The project results were significant and address many aspects of sustainable development in the production of clean food (vegetables, herbs and fruit) and the provision of education for the city. Figure 13 shows GLIGAMESH and other competitors’ value propositions. The project, which is represented by the green line, has stronger value propositions than the neighbouring project FICO Eataly World (red line) – Fico means Figs in Italian. It integrates art and nature and increases the social integration of disadvantaged people (Figure 13). Project customers can enjoy artwork, eat and purchase products. Therefore, we also identified restaurants and art galleries among our main competitors. Although restaurants might have lovely furnishings, they do not offer, as GLIGAMESH does. Our restaurant provides a nice view when visitor walk through the open outdoor space, while looking downward to see artists painting in their studios, located under skylight. Restaurant clients have also the opportunity to enjoy the farm’s green spaces, which are more suitable for family lunches.
Conclusion

The GILGAMESH project has transformed the abandoned site and vacant building, which was considered a black hole in the city, into a hub for sustainability and education. It integrated the urban farm into its surrounding urban context to create a vibrant heart for the city of Conegliano. This project covered all three pillars of sustainability, that is, environmental, social and economic aspects, to achieve a self-sustained and generative hub that creates new jobs in its four phases. The project also reduces the footprint of the city, yet it is an innovative model to be followed in other cities in Italy and worldwide. It combines art, architecture and agriculture to generate clean food, connectivity and social innovation through a range of social spaces. In addition, the urban farm attracts citizens and students to the new site to enhance learning. GILGAMESH has created a liveable, healthy and sustainable urban environment in the city. Moreover, the project redevelopment has contributed to attaining SDGs 4, 6, 7, and 8 as well as SDGs 9, 11, 12 and 13, which were explained in the modules of the AID course. It was clearly demonstrated that higher education can play a key role in implementing sustainable development and SDGs.

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PART III – Revising Institutional Strategies in the Context of the 2030 Agenda
Powering Local Sustainable Development Goal Projects Using a Zero-Energy Campus Building

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Abstract
According to the report from the Sustainable Development Solutions Network entitled The 2019 US Cities Sustainable Development Report, Lancaster, Pennsylvania ranks 50th among US cities in progress toward achieving the Sustainable Development Goals (Lynch et al., 2019). This case study explores how the work of the Millersville University (MU) administration, faculty, students, sustainability office staff and facilities staff have all contributed to developing a unique programme aimed at raising campus and community awareness of the Sustainable Development Goals (SDGs) while also improving community performance on specific goals. MU constructed a new zero-energy campus welcome centre in 2018, which offered a unique opportunity to raise community awareness of sustainability. MU facilities, finance and sustainability office staff designed a programme that uses utility rebates and cost savings associated with the building’s energy-efficient design to fund micro-grants for student-led community projects centred on the SDGs. In its first year, the so-called Positive Energy Fund has inspired several campus-community partnerships focused on addressing community poverty and hunger (SDG 1, 2), increasing green infrastructure (SDG 6, 11, 13) and supporting STEAM (science, technology, engineering, art and maths) in local elementary schools (SDG 4). In the spring of 2019, the building was certified as the first zero-energy building in Pennsylvania and it is currently one of the highest energy-performing buildings in the country. The work has helped MU to address the priorities set by the Global University Network for Innovation (GUNi) to implement the 2030 Agenda, including raising SDG awareness, strengthening partnerships, advocating for improved policy and supporting transdisciplinary work.

Introduction
In a report entitled Implementing the 2030 Agenda at Higher Education Institutions: Challenges and Responses, GUNi outlined four approaches for higher education institutions (HEIs) to pursue the 2030 Agenda: 1) awareness raising, 2) more and stronger partnerships, 3) advocating for an improved policy environment and 4) support for transdisciplinary work at, and between, HEIs and other organizations (Villalta et al., 2019). This case study explores work by Millersville University (MU) administration, faculty, staff and students to implement each of the four approaches using the latest addition to the MU campus: the zero-energy Lombardo Welcome Center. In its efforts, MU has explored the ways in which a green building can be more than a demonstration of sustainable design. It can also embody a university’s mission and provide a platform on which to build multifaceted efforts to advance the Sustainable Development Goals (SDGs).

The Local Economic and Social Ecosystem
Lancaster, Pennsylvania: Ranked 50th among US cities in progress toward achieving the SDGs
Located in Lancaster County, Pennsylvania, MU is a liberal arts institution with an annual enrolment of approximately 8,000 students. Lancaster County, Pennsylvania is recognized internationally for its rich agricultural resources, land stewardship and thriving Amish and Mennonite communities (Lancaster County Government Center, 2019). The City of Lancaster is located in the centre of Lancaster County and has a diverse population.
of approximately 60,000 individuals who belong to various demographic groups (U.S. Census Bureau, 2018). The city has a cultural tradition of welcoming immigrants and has recently received international attention for a growing refugee population that is twenty times greater than the US national average (Strasser, 2017). Like many cities in Pennsylvania and across the US, the City of Lancaster experienced an economic decline toward the end of the last century and has since been engaged in economic development and community revitalization efforts (City of Lancaster, 2020) that are growing in success. According to The 2019 US Cities Sustainable Development Report, Lancaster, Pennsylvania ranks 50th among US cities for performance toward achieving the SDGs. The city’s performance is ranked good for SDG 10 (reduced inequalities) and poor for SDG 1 (no poverty), SDG 4 (quality education), SDG 5 (gender equality), SDG 7 (affordable and clean energy) and SDG 13 (climate action) (Lynch et al., 2019).

Millersville University: History and mission committed to positive impact

MU’s mission is to “provide diverse, dynamic, meaningful experiences to inspire learners to grow both intellectually and personally to enable them to contribute positively to local and global communities” (Millersville University, 2019a). MU is a member of the Association for the Advancement of Sustainability in Higher Education (AASHE) and it is a Princeton Review Green College. In addition, Millersville has received numerous sustainability awards, including a 2019 Climate Leadership award for cross-sector collaboration from Second Nature, a 2019 US Department of Education Green Ribbon School award and an American Association of State Colleges and Universities (AASCU) Sustainability and Sustainable Development Innovation Award (Millersville University, 2019b).

The Zero-Energy Lombardo Welcome Center

In the heart of MU’s campus stands the zero-energy Lombardo Welcome Center, the first in Pennsylvania, and one of only about 120 in the US, to receive a zero-energy certification from the International Living Future Institute (ILFI) (NBI, 2020). Constructed in 2018, the building measures 15,760 square feet and it contains zoned heating and cooling systems, LED lighting, radiant floor heating and passive heating and cooling elements, all of which contribute to its achievement of an energy use intensity (EUI) of 25 kBtu/ft². The building’s energy requirements are met through a 190-kW solar array consisting of 528 rooftop solar panels, a 30-panel dual-axis tracking ground array and solar glass along the south-facing rear wall as well as 20 ground-source heat pumps. Between 1 May 2018 and 30 April 2019, the Lombardo Welcome Center generated 204,391 kWh of electricity while consuming only 115,853 kWh. In fact, the building far exceeded design expectations, generating 75% more energy than it uses and achieving a net EUI of -19.7 kBtu/ft². This makes it one of the highest energy-performing buildings in the country (ILFI, 2019).

MU saw in the Lombardo Welcome Center’s unique design an opportunity not only to share a model of sustainable design, but also to advance local sustainable development by raising awareness of the SDGs, informing and supporting policy and even directly funding community partnerships and transdisciplinary work.

Raising Awareness

The Lombardo Welcome Center’s status as the first building in Pennsylvania to receive zero-energy certification from the ILFI has provided MU with an opportunity to raise awareness of the SDGs among MU students and the surrounding community. As MU’s admissions building and welcome centre, it is the first building to be encountered by most campus visitors, including prospective students and their families. Over 10,000 prospective students and their family members begin their MU visit at the Lombardo Welcome Center and an additional 1,000 community members (e.g., government officials, business professionals, industry groups) tour the building each year.

The visitors supply a steady stream of user groups to test messaging and determine what resonates locally. Lancaster County has a deep cultural commitment to land stewardship and conservation, but the awareness of sustainability principles, sustainable development and climate change is less broad. Fewer Lancaster County residents (58%) think that global warming is happening than the US national average (67%) and less than half (49%) think that global warming is mostly caused by human activities. Despite these figures, there is still broad support for renewable energy. Nearly 80% of Lancaster
County residents support funding research into renewable energy sources and providing tax rebates for energy-efficient vehicles and solar panels (Marlon, 2019). Lombardo Welcome Center tour guides, therefore, focus on the building’s renewable energy technologies, emphasizing the social and economic benefits of transitioning to an advanced energy economy. Over time, tour guides develop a tailored vocabulary that resonates with visitors, creating space for groups to explore topics such as climate change and sustainable development. Doing so within small groups provides space for visitors to ask questions, challenge assumptions and compare their beliefs to others (ideally), it also engages those who might not otherwise be exposed to social and environmental issues, sustainability principles or the SDGs.

Touchscreen dashboards in the Welcome Center’s lobby provide a unique form of outreach. In addition to showing the real-time energy performance of the building, the dashboards provide each visitor with information about MU’s sustainability programmes, its climate change commitments and the SDGs (Millersville University, 2020a). The dashboard landing page includes the SDG wheel icon with a question targeted at current and prospective students: “What global problem will you solve?” (Millersville University, 2020b). The underlying dashboard page presents MU’s academic programmes organized by the SDGs. For example, students interested in ending poverty can explore majors in social work, while those interested in climate change can explore undergraduates majors in earth sciences and graduate degree programmes in climate science. MU has similarly crosswalked all of its courses with the SDGs to develop a database of SDG learning opportunities. These resources and the underlying coursework empower students to approach their academic experience with a problem-solving mindset oriented toward the SDGs.

More and Stronger Partnerships

The Lombardo Welcome Center’s positive energy performance has raised the profile of sustainability principles at MU and in the community, creating space to develop an innovative programme centred on community partnerships, social entrepreneurship and youth innovation for the SDGs. The programme, entitled the “Positive Energy Fund,” uses cost savings associated with the surplus energy generated by the Lombardo Welcome Center to provide micro-grants (up to $2,500) for local projects that support the SDGs (Millersville University, 2020c). Named after the surplus energy generated by the Lombardo Welcome Center and MU’s mission “to contribute positively to local and global communities,” the Positive Energy Fund seeks to raise awareness of the SDGs through the development and execution of student-led community projects that can be scaled to have global impact.

In designing the Positive Energy Fund, MU sought to leverage the mental and physical space that higher education institutions (HEIs) provide students to imagine and test ideas, to be inspired and to innovate. MU recognized that young innovators are passionate and determined to deliver positive change for the world and that their passion is often first operationalized through partnerships that address problems affecting their local communities. MU fashioned the Positive Energy Fund to address innovation barriers identified in the 2017 report from the Sustainable Development Solutions Network (SDSN) Youth entitled Supporting Youth-led Innovation to Achieve the SDGs. These barriers include access to financial and human capital, capacity-building and mentorship support, limited visibility and access to networks, and regional disparities and knowledge gaps (Pisebi et al., 2017). As an example, the Positive Energy Fund provides financial capital through micro-grants that allow students to pilot ideas within a supportive university environment. The Positive Energy Fund also encourages mentorships and partnerships by requiring that students involve a faculty or staff mentor in their project who can provide technical support and guidance. Faculty and staff mentors, as well as alumni mentors supplied through MU’s mentorship programme, also connect students to a network of individuals who can offer project guidance and connections to community partners to develop project ideas (Pisebi et al., 2017). Resources and guidance supplied through the Positive Energy Fund’s support materials, such as SDSN’s US Cities Sustainable Development reports and the City of Lancaster’s economic development plan, ground students in local challenges to ensure that the projects reflect the local context.

MU awarded $10,000 in micro-grants through the Positive Energy Fund during its first year in operation to support four partner-focused projects: an Integrating Art into Green Infrastructure workshop in collaboration with Lancaster’s public works department (SDG 6, 11, 13), a STEAM native garden project in urban schools in collaboration with the National Wildlife Federation (SDG 4, 11, 15), a micro-media programme featuring Lancaster
Advocating for an Improved Policy Environment

Zero-energy buildings like the Lombardo Welcome Center provide a physical demonstration of sustainable technologies that appeal to diverse audiences and can help to increase support for sustainability-based policy. In the past year, MU has hosted dozens of events at the Lombardo Welcome Center and participated in dozens of local and national conferences, meetings and promotional events where the building’s sustainable features have been shared alongside MU’s support for the SDGs. Using the Lombardo Welcome Center as a starting point, MU faculty, staff and students have discussed the SDGs with local business leaders, HEI chief financial officers and members of state and local government, including the governor of Pennsylvania.

The Positive Energy Fund is also supported directly by state energy efficiency legislation and, as a result, helps to raise awareness of, and support for, such legislation. Pennsylvania state law requires electric power distribution companies to reduce energy use within their service territories, which the companies accomplish, in part, by implementing rebate programmes for energy efficiency projects (IEEA 2016) and demand response programmes. MU used $25,000 obtained through rebates for the Lombardo Welcome Center and other campus energy efficiency projects as seed money for the Positive Energy Fund. In promoting the fund and the projects that are supported, MU raises awareness of state energy efficiency programmes and encourages others to apply.

In public presentations and other forums, MU ties the Lombardo Welcome Center’s success to MU’s goal of becoming carbon neutral. Presenting the viability of renewable energy technologies is particularly important in Pennsylvania, which ranks fourth among US states for greenhouse gas emissions, primarily due to fossil-fuel-intensive energy production (US EIA, 2019). MU has also signed national commitments that call for climate action and, under these commitments, helped the City of Lancaster to prepare its first climate action plan (City of Lancaster, 2019).

Support for Transdisciplinary Work at, and between, HEIs and Other Organizations

The evaluation criteria used to award Positive Energy Fund grants were created specifically to encourage partnerships and transdisciplinary work within and beyond MU. The first round of projects included collaborations in several of the SDG areas. As an example, the Integrating Art into Green Infrastructure workshop brought together Lancaster City public works staff, MU art department faculty and students, MU facilities staff, a nationally recognized artist and city residents to co-develop urban green infrastructure installations in low-income neighbourhoods. The planned green infrastructure will be culturally relevant while also helping to beautify the neighbourhood and increase climate resiliency. These collaborations help to demonstrate the value of transdisciplinary work to students while also building relationships within and beyond MU (Millersville University, 2020d).

Transdisciplinary work involving universities and their community may build a virtuous cycle of investment and support that increases community prosperity and university vitality, particularly for universities like MU whose student population is comprised primarily of students from the surrounding region. Projects funded by the Positive Energy Fund help to address systemic issues such as poverty, hunger and education that limit sustainable development and community prosperity. Connecting students to these issues may spark a spirit of social entrepreneurship that continues into their careers, perhaps encouraging many to stay in the region and contribute to its long-term prosperity. Prosperous communities are likely to have higher high-school graduation rates as well as more adult learners who are interested in continuing their education. Those universities that demonstrate that they are not only a place of learning but also an active force for positive change may be best positioned to attract students who are capable of doing the same.

Conclusion

HEIs are well positioned to play a vital role in advancing the SDGs through well-understood mechanisms such as research and coursework; however, more and faster progress requires integrating the 2030 Agenda in all HEI
activities, which can be challenging given the size and diversity of HEIs. For some HEIs, the opportunity to galvanize support for incorporating the SDGs into their institutional strategy may come from connecting the 2030 Agenda to university successes. At MU, the award-winning zero-energy Lombardo Welcome Center has provided a physical space to raise awareness of the SDGs, a source of funding to support partnership-based projects that advance the SDGs locally, a platform for promoting SDG-centred policies, and a mechanism for inspiring transdisciplinary work centred on the SDGs. Through these efforts, MU faculty, staff and students, together with community partners, are finding that the SDGs unlock new and better opportunities to create more and stronger partnerships through a deeper understanding of shared values and common language.

References


Living Learning Lab for Javeriana’s Students
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Abstract
As an academic institution, the Pontificia Universidad Javeriana is committed to sustainable development and applies Education for Sustainable Development (ESD) in its three main functions (teaching, research and extension). This strategy is part of the university’s Institutional Ecological and Environmental Policy and the global framework of the Sustainable Development Goals. As a systemic, participatory approach, education for sustainable development is supported by the university's governing bodies (the rector, the academic and research vice-rectors and the faculties) and its primary goal is to include sustainability issues in academic programmes. This is achieved through the creation of a teacher training programme, inclusion of sustainability issues in undergraduate and graduate programmes, the creation of new courses, a review of the current academic curriculum, the Interdisciplinary Lectureship in Sustainability, and COSMOS - Living Learning Lab for Javeriana’s students (LLLJAV). LLLJAV promotes actions developed by lecturers, students, management and administrative staff to train students in sustainability from an interdisciplinary approach, and contribute to the comprehensive training and construction of competencies for sustainable development. LLLJAV is made up of the Design Factory Javeriana, Sencity, Sustainable Dentistry, the Sustainable Campus Classroom, Sustainable Medicine and Green History.

Introduction
Given the complex nature of sustainability issues, it is imperative that education for sustainable development should be based on an inclusive approach. The concept of sustainability throughout the university should be considered, to encompass the functions of the entire institution and benefit from sharing the knowledge, ideas and experiences that influence sustainability in general and student learning. Good pedagogical practice in sustainability involves demonstrating to students the connections between theory and practice so that they can recognize the relationship between their studies on campus and the world at large (AACC’s SEED Center, 2015). This social and environmental transformation increases sustainable initiatives and solutions for the university and surrounding communities; strengthens collaborative networks among students, teaching staff, managers and administrators; consolidates meaningful learning experiences that are generated in the university community, mainly among students; and teaches key competencies for sustainability.

Within the framework of education for sustainable development, the Living Learning Lab links research, teaching and operational (campus management) activities with the university community, and trains this community to solve current socio-environmental challenges. The university campus and surrounding communities constitute a laboratory that is readily available for practical projects and act as an alternative curriculum for students to apply what they learn in the classroom (Mcmillin & Dyball, 2009). The Living Learning Lab accelerates the adoption of sustainable development in higher education, through the application of active, experiential teaching and pedagogies (Mathias, 2019), where “learning by doing” includes activities such as project-based learning, problem-based learning, community service learning, experiential workshop-based learning, hackathons, simulations and design processes. These approaches are compatible with interdisciplinary, transdisciplinary, participatory and community-based educational and...
research approaches. In these projects, academics (students and teaching staff) collaborate with non-academic experts (operations staff and administrators) in all phases of a project, to produce results that are scientifically sound, applicable and respond to the challenges of university sustainability (Brundiers, Wiek, & Redman, 2010). Experiential learning implemented through the Living Learning Lab generates fundamental competences for solving socio-environmental problems when knowledge is applied in real life outside the university (Safitri, 2017).

In this context, the Pontificia Universidad Javeriana is implementing the strategy COSMOS - Living Learning Lab Javeriano (LLLJAV), within the framework of the Plan for Ecological and Environmental Management - COSMOS, which complies with the university’s Ecological and Environmental Policy. LLLJAV is a training strategy in sustainability that seeks to transfer knowledge to the real world through the practice of innovative academic activities to construct quality education. It constitutes a commitment that has a wide impact on the university, linking students and teachers in various faculties, the Administrative Vice-Rector’s Office and the Vice-Rector’s Office for the University Environment in a transversal way. Its implementation contributes fundamentally to the institution and to the fulfillment of the objectives of the Management Plan - COSMOS, which include: focusing the Javeriana community, with ethics and values to strengthen responsible environmental practices, and permanently seeking coherence in the university between its identity and its work from an ecological and environmental perspective. The contribution to these objectives helps to achieve the strategies of the Ecological and Environmental Policy, including the incorporation and coordination of the ecological and environmental dimension in teaching processes, research, extension, the university environment, administration and campus management and the sensitization, awareness raising and training of the educational community to participate actively in the environmental management of the university and in the implementation of Sustainable Development Goals.

LLLJAV puts into practice the principles of education for sustainable development through five major educational and innovative projects: Design Factory Javeriana, Sencity, Sustainable Dentistry, Sustainable Campus Classroom and Green History. These projects are based on integral ecology and aim at social transformation within the framework of sustainable development.

1. Javeriana Design Factory

The Design Factory is part of the LLLJAV strategy. It is defined as a laboratory of encounters in which ideas, including those of sustainability, are shared and put into practice through a pedagogical model that invites, motivates and allows collaboration between diverse disciplines in the search for innovative solutions based on design processes. Synergies are generated that can lead to more advanced stages, always with the aim of being built with the interdisciplinary contribution of any person in the university community (teachers, students, administrative staff or workers). There are only two restrictions: traditional teaching is not allowed and all work teams must be made up of people from two or more knowledge areas or professions. The work of Design Factory Javeriana is supported by a network of 24 initiatives with the same name in the world, in areas as varied as academia, business and industry, focused on global challenges such as sustainable development, and in research environments such as that of the European Organization for Nuclear Research (CERN), which is also a member of the Design Factory Global Network.

2. Sencity

Within the framework of the LLLJAV, the goal of Sencity is to develop a sustainable infrastructure on the University Campus, to reduce the impact of human activities on the environment. This project has been consolidated over time through the participation of numerous experts from several faculties. One of the developments has been to construct an air purification system that integrates technology and science, with the use of the capacities of nature. The system was constructed using an interdisciplinary, collaborative, participative approach, with the support of professionals from medicine, architecture, biology, microbiology, communication, administration, engineering and industrial design. Professionals have been involved in all phases of development, including the generation of theoretical concepts and the design and construction of the system. Similarly, with the support of the above faculties and from a research and environmental management approach, an air and water purification system using photosynthetic unicellular algae and plants present in local mixed ecosystems is in the construction stage. It employs a technological package that allows the user to
determine in real time the incidence of algae and plants on air quality. The university community can participate in the operation of the system by injecting air through manual mechanisms. This activity, in addition to increasing the effectiveness of the system, affects the promotion of sustainable behaviour.

3. Sustainable Dentistry
For several years, the Faculty of Dentistry has been developing a process of transformation towards an environmentally sustainable Javeriana School of Dentistry. Together with the Faculty of Architecture and Design, the Faculty of Environmental and Rural Studies and COSMOS, the Faculty has generated various projects to transform the work of the dentist so that it is in line with the needs of sustainable development. This integration has led to several activities within the framework of collaborative, participative, interdisciplinary work. Some are implemented from industrial design and dentistry careers in which teams of students and teachers work together to solve the most relevant problems faced in the teaching and practice of dentistry from the perspective of sustainability. The results have been diverse, including prototypes, applications and instruments built to teach environmentally friendly oral care, filtration of hazardous contaminants, proper waste management, process management systems, human clothing, recoverable protection equipment, carbon footprint reduction, and efficient energy use and savings.

Two innovation projects have resulted from these interdisciplinary training processes:

I. A project generated by a team of dentistry and industrial design students to develop a more suitable sterile packaging waste management system, accompanied by the Design Factory Ignition programme. In this programme, for ten weeks of the semester, students are supported by experts from different areas who strengthen the implementation of the initiative. The aim of Ignition is for academic projects to be carried out at more advanced levels of design and production to consolidate real implementation of the project with a business programme.

II. The second project is being developed by lecturers in dentistry, industrial design, architecture and microbiology. The objective is to reduce heavy metals and water-polluting particles by using part of the waste generated at the university as a filtering material. The waste can be used to process other waste, so that it is reused before it has a greater negative impact on the environment.

4. Sustainable Campus Classroom
From LLLJAV, the Sustainable Campus Classroom strengthens the processes of student training in sustainability at the university. Sustainability-related subjects are incorporated into this project from the Faculty of Architecture and Design and the Faculty of Environmental and Rural Studies. The subjects are Education for Sustainability, Ecology for All, Urban Facilities, Technologies and Digital Spaces, Design for Sustainability and Sustainable Design. This commitment to sustainability has led to the development of a major academic exercise in which nine teachers of six subjects work in coordination with each other and the students to develop solutions to real problems on the campus, so that they can be presented to the university community in general. Successful initiatives can be implemented within the framework of the Ecological and Environmental Management Plan - COSMOS.

5. Sustainable Medicine
Sustainable Medicine is a project that addresses sustainability issues in the public health subject taught to tenth semester students in the Faculty of Medicine. In partnership with COSMOS, students use the University Campus to identify socio-environmental problems associated with human health, analyze their context and propose solutions. The work is presented to lecturers and staff in charge of environmental management of the Campus, and implementation is considered.

6. Green History
In the framework of LLLJAV, Green History is a project that has been running for over ten years. It is coordinated by the Vice-Rector’s Office of the University Environment, the Vice-Rector’s Office of Administration and the Faculty of Environmental and Rural Studies. Its objective is to restore, in the most appropriate, varied and educational way, part of the beauty and richness of the Andean forests around the University so that the green areas of the Campus become a Botanical Garden. Through Green History, with the interdisciplinary participation and collaboration of the entire university community, knowledge is explicitly transferred from the classrooms to action. Experiential activities are carried out, including working towards carbon neutrality, planting a new campus.
and recycling wood. Green History also links new intake students to university sustainability. Trees are planted when new students arrive at the institution and activities are carried out with the Grupo Javeriano de Ornitológia (GJO), whose objectives include observing, studying and cataloguing the birds on campus. GJO is also involved in the management and control of the cat population at the university, through the Campus Cats programme. By caring for the Javeriana Botanical Garden, Green History has promoted an experiential approach of the university community to nature, through the contemplation and enjoyment of existing species, and recognition of their contributions.

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Enhancing the Role of Arab Gulf States Universities in Achieving the SDGs: The Case of Sultan Qaboos University

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Abstract

In its efforts to make the world safer and more sustainable, the United Nations launched Agenda 2030 for Sustainable Development in 2016, establishing the Sustainable Development Goals (SDGs). These 17 goals are comprehensive, covering all aspects and fields such as health, industry, the environment, water, etc. All governments around the world, supported by their systems (e.g., their education systems), are expected to work hard and dedicate themselves to achieving the SDGs. Higher education systems are no different. Universities should be leading the way toward the attainment of sustainable development, playing pivotal roles. At the same time, there is no doubt that universities globally differ in their efforts based on their context and surrounding environment.

This paper aims to shed light on the role played by Arab Gulf States (AGS) universities in achieving the SDGs. It also sets out to present a vision of how to activate the role of these universities in the Arabian context. Sultan Qaboos University (SQU), which is located in the Sultanate of Oman, offers a case study that is representative of AGS universities. Examining the current status and efforts of SQU in helping to attain the SDGs is the primary focus of the paper, which also examines SQU’s challenges and obstacles in playing this role, before concluding with recommendations to make SQU more effective in supporting the Omani government’s efforts to reach the SDGs.

To achieve its aims, the paper is qualitative in nature, utilizing policy document analysis, statistics, reports and semi-structured interviews as tools to collect data. Interviews were conducted with policy-making elites in the university. Available documents such as the SQU Strategy 2016-2040 and the annual reports of SQU units were used to identify the current status.

It was found that SQU was unintentionally working to achieve the SDGs in its three basic functions (teaching, scientific research and community service). The findings also showed that some of SQU’s challenges were internal to the university, while others were the result of external factors beyond its control. Overall, the case study offers an example of how universities in developing nations are currently working and how they should work to help bring about sustainable development.

Introduction

In its efforts to make the world safer and more sustainable, the United Nations launched Agenda 2030 for Sustainable Development in 2016, establishing the Sustainable Development Goals (SDGs). These 17 goals are comprehensive, covering all aspects and fields such as health, industry, the environment, water, etc. All governments around the world, supported by their systems (e.g., their education system), are expected to work hard and dedicate themselves to achieving the SDGs. Higher education systems are no different. Universities should be leading the way toward the attainment of sustainable development, playing pivotal roles. At the same time, there is no doubt that universities globally differ in their efforts based on their context and surrounding environment.

As in other regions of the world, the higher education systems in the Arab Gulf region are expected to contribute...
PART III – Revising Institutional Strategies in the Context of the 2030 Agenda

to and play a role in working toward sustainable development as prescribed by the UN in the SDGs. In the face of the various challenges and issues relating to the environment, the people and society generally in the Arab Gulf States (AGS) region, the region’s universities have a greater responsibility to find solutions and prepare citizens who can pursue sustainable development nationally and globally.

Problem Statement

Navigating the websites of various universities in the AGSs, we found no mention of the SDGs. This indicates that there was not enough attention being paid by AGS universities to achieving the SDGs and therefore that their involvement with the SDGs needed to be investigated. Moreover, the researcher for this paper attended a regional meeting organized by UNESCO Beirut on the role of Arab universities in achieving the SDGs, which was held in Cairo, Egypt on 25 and 26 September 2019. At the regional meeting, the researcher found that the SDGs were not on the agenda of most Arab universities and little, if any, effort was being directed toward the SDGs by Arab universities. This prompted the researcher to think deeply about activating the role of Arab universities in achieving the SDGs. Indeed, the present paper is a result of concern over the weak role being played by Arab universities.

Based on the statement of the problem, the paper aims to shed light on the role being played by AGS universities in achieving the SDGs. It also sets out to present a vision of how to activate the role of these universities in the Arab context. Sultan Qaboos University (SQU), which is located in the Sultanate of Oman, offers a case study that is representative of AGS universities. Examining the current status and efforts of SQU in helping to attain the SDGs is the primary focus of the paper, which also examines the challenges and obstacles faced by SQU in playing this role, before concluding with recommendations to make SQU more effective in supporting the Omani government’s efforts to reach the SDGs. Overall, the paper will answer the following questions:

1. What is the current status of SQU in response to achieving the SDGs?
2. What are the challenges and obstacles facing SQU in helping to achieve the SDGs?
3. How can SQU’s role in contributing to achieve the SDGs be improved?

The Context

In a globalized world, education systems and their policies fall within the framework of national, regional and global discourses (Al’Abri, 2011). More specifically, higher education systems everywhere have national issues and considerations that have evolved in relation to their specific contexts, cultures, political histories, politics and state structures (Marginson, 2006; Marginson & Rhoades, 2002). Higher education institutions (HEIs) are embedded in a national setting as well as a global setting, giving rise to a certain level of pressure on higher education (HE) policies from both inside and outside the nation. Although HE systems face the challenge of globalization, Vaira (2004) argues that HEIs “are also embedded in a national political, regulatory and governance system which shapes their structural and organizational features” (p. 458).

If we consider the context, we have to talk about the Arab Gulf States (AGSs) in greater detail. They are six countries: Oman, Kuwait, Qatar, Saudi Arabia, Emirates and Bahrain. Overall, these countries share geographical borders and similar cultural, social, linguistic and economic contexts. There is no doubt, however, that there is variation in the economies of the AGSs, some of which are richer (the oil and gas exporters). Education was not a focus in these states before the discovery of oil in the region in the 1960s. As a result, higher education (i.e. universities) started late in the region. According to Hayes and Al’Abri (2019), higher education in the AGSs has undergone development and reform with the aim of serving the people of the region and bringing economic development.

Since this paper focuses on Sultan Qaboos University (SQU) as a case study for AGS universities, let us look briefly at its background. SQU was founded in 1986 to serve Omani society by preparing a cadre able to contribute to the development of the nation. As noted by Al’Abri (2019), SQU is the premier university in Oman and its creation marked the official start of the Omani higher education system in the mid-1980s. SQU’s current population is around 17,000 students spread across nine colleges and its vision is “to continue its national leading role in higher education and community service and also
to be internationally recognized for innovative research, the quality of its graduates, and strategic partnerships. It is clear that global impact is regarded as a main factor in directing university activities. This paper will look at the SDGs as a global initiative to guide SQU’s mission in serving Oman and the world.

Literature Review

Higher education has been found to be central to the development of nations. It plays a huge role in the prosperity of countries by developing trained and educated nations, finding solutions to issues through research and offering services to the community. In the 2030 Agenda for Sustainable Development, nations are urged to “ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university” (UN, 2015). Being mentioned clearly in the SDGs (see target 4.3) points to the importance of higher education and its vitality to society. It is also significant to note that higher education is seen a critical factor in achieving other goals related to poverty (SDG 1); health and well-being (SDG 3); gender equality and governance (SDG 5); decent work and economic growth (SDG 8); responsible consumption and production (SDG 12); climate change (SDG 13); and peace, justice and strong institutions (SDG 16) (UNESCO, n.d.).

That said, universities and other HEIs also have a responsibility to play their role in the achievement of sustainable development. To do so, however, HEIs need to redesign and reform their efforts, as Owens (2017) argues that “universities must focus on fully developing all three educational missions – teaching and learning, scientific research, and community service” in order to contribute to sustainability and development globally. Owens (2017) also recalls here that the current role being played by HEIs has to be reviewed and reconsidered, and efforts need to be made to join the rest of the world in achieving the SDGs.

Since the SDGs were declared in late 2015, studies and reports have addressed the expected role of HEIs in achieving the SDGs. For example, Bhowmik, Selim and Huq (2017) note that universities should play a key role by providing knowledge, innovations, and solutions in response to the challenges stated in the 17 SDGs; developing, assessing and monitoring policy options for achieving the SDGs; providing personal and professional skills to future stakeholders (e.g. policymakers, innovators, entrepreneurs) who will contribute to achieving the SDGs, and educating the public about and advocating for the SDGs.

According to SDSN Australia/Pacific (2017), there is a need for a whole-of-university approach to work effectively. More specifically, the following steps have been suggested for universities to deepen their engagement with the SDGs:

1. Mapping what they are already doing
2. Building internal capacity and ownership of the SDGs
3. Identifying priorities, opportunities and gaps
4. Integrating, implementing and embedding the SDGs within university strategies, policies and plans
5. Monitoring, evaluating and communicating their actions on the SDGs.

Indeed, the above steps are useful as a framework for universities to engage with the SDGs. This paper will use them similarly as a framework to evaluate SQU’s efforts in achieving the SDGs.

Research Methods

To achieve its aims, this paper is qualitative in nature, utilizing policy document analysis and semi-structured interviews as tools to collect data. Interviews were conducted with policy-making elites in the university (3 officials from the top leadership of the university). Available documents such as the SQU Strategy 2016-2040 (SQU, 2015) and the annual reports of SQU units were used to identify the current status.

Findings and Discussion

The data show that SQU has not been setting specific targets to achieve the SDGs. Yet, it was also found that SQU was unintentionally working to achieve the SDGs in its three basic functions (teaching, scientific research and community service). The three interviewees mentioned that there were no specific efforts (workshops, training, research, etc.) carried out to contribute toward the attainment of the SDGs. At the same time, the interviewees argued that there has been much work done
around the topics covered by the SDGs. They pointed to some research, courses and community services that were related to the SDGs. For instance, one interviewee raised the example of a research project on water desalination.

Based on the interviews, the framework prescribed by SDSN Australia/Pacific (2017) for university engagement with the SDGs is not applicable to SQU. The first step, which is alignment and mapping what is already being done, is not present. The other steps of capacity building, priority setting, implementation and mentoring were also absent from the interviewees’ responses. The conclusion is that SQU has not made specific efforts to engage with the SDGs and play its part as a university.

On the other hand, an analysis of the SQU Strategic Plan 2016-2040 shows that the plan was developed in alignment with the Sultanate’s national development goals, which are set out in the Oman Five-Year Plan (2016-2020) (SQU, 2015). This ninth five-year plan has a strong focus on sustainable development. Also, the SQU Strategic Plan 2016-2040 is aligned with Education Strategy 2040, which has a focus on comprehensive social development in which education is a core component.

Moreover, the National Strategy for Education 2040 and the SQU Strategic Plan (2016-2040) were both prepared in accordance with the educational philosophy of the Sultanate, which was updated in its latest version in 2017. This philosophy is based on developing positive attitudes toward human prosperity and happiness, establishing principles of equality and justice, accepting the other, and developing awareness of children’s and women’s rights (The Education Council, 2017). In addition, the philosophy addresses a variety of topics covered in the SDGs, such as the dialogue of civilizations, human rights, democracy and international justice, globalization, world trade, environmental and information security, water security and food, and the prevalence of technology. Consequently, we can say that the SQU Strategic Plan has to some extent concentrated on various targets set out in the SDGs, although not intentionally.

Based on the analysis of the SQU Strategic Plan (2016-2040), it can be argued that SQU has dealt indirectly with the SDGs as follows:

- The university, through its goals, is a tool for changing and developing the society to which it belongs, and a true supporter of sustainable development. This is happening by preparing educated cadres who are working to improve and develop society and to find solutions to problems.
- The university has a strong focus on scientific research which plays a role in achieving sustainability through the study of phenomena related to the environment, society, economics and other societal aspects.
- It appears from the analysis that the university has decided to play an active role in society by providing services in a variety of fields.

The findings also show that some challenges were internal to the university, while others were the result of external factors beyond the university’s control. The interviewees pointed to financial constraints as one of the challenges to dealing properly with the issues raised by the SDGs. Other challenges included the academic autonomy of faculty, the bureaucracy within the university and the government, and university independence from government control. These challenges will be addressed in the recommendations below.

Recommendations and Conclusion

Based on the findings, the paper offers the following recommendations:

1. SQU should make efforts to align its strategy, plans, activities, teaching and research to the SDGs. A steering committee should be formed at higher levels of the university leadership to plan and monitor alignment efforts and implementation.
2. There should be some capacity building on the SDGs for a team of staff and faculty. This will help in creating a group that works toward increasing SQU’s efforts to contribute to achieving the SDGs.
3. SQU should start searching for other funding sources, building partnerships with the private sector and those who are able to provide support and funding for research projects. SQU should also work toward adopting the concept of a productive university by seeking to internationalize its services. This will contribute to attracting international organizations and students and to generating funds.
4. Administrative and financial independence should be granted to the university to facilitate in the performance of its tasks and responsibilities in order to enable it to achieve the SDGs.

5. SQU should continue its efforts to monitor the quality of its programmes and other research and community services.

6. Various incentives should be provided to attract scientists and faculty to the university as sources of innovation and creativity that contribute to achieving the SDGs.

7. The university community should be educated about the SDGs and the roles expected of different groups to achieve the SDGs.

8. Scientific research should be focused on as a primary contributor to achieving sustainability. SQU should adopt research projects that focus on the environment, the economy and sustainable development.

9. It is important to enhance the university’s role in serving the local community by providing services and workshops in areas related to sustainable development, and by identifying and responding to the needs of the community.

10. The principles of sustainable development should be developed in the administrative and organizational processes of the university, at all levels of governance. Overall, this case study offers an example of how universities in developing nations are currently working and how they should work to bring about sustainable development and achieve the SDGs.

References


Revising Institutional Strategies in the Context of the 2030 Agenda to Integrate Sustainable Development Goals into University Policy: The Experience at the URV

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Abstract
The current Rector’s Council of Rovira i Virgili University (URV), which began its term of office in May 2018, has an action programme based on many of the values that have also inspired the United Nations Agenda 2030 and its 17 Sustainable Development Goals (SDGs), including ethics, professional responsibility, lifelong learning, research with a social impact, equality, sustainable development, health, equity and attention to people with socioeconomic difficulties. For this reason, the Rector’s Council has decided to align its actions with the SDGs. In practical terms, the SDGs are described in two documents that reflect the URV’s actions and accountability. These documents are the “Rector’s Annual Report to the University Senate” (an internal document submitted to the highest representative body of the university community) and the “Overview Report”, which is aimed at the university and society as a whole.

The Rector’s Annual Report summarizes the actions carried out during the academic year and aligns them to the corresponding SDGs. This is the first time that the report has been structured in this way and the Rector wants the structure to be adopted for all reports drafted by the rest of the URV (i.e. faculties, departments, institutes, research groups, student councils, etc.). The URV’s focus on the SDGs requires each of its activities to be assessed in terms of whether these goals have been achieved.

The “Overview Report” summarizes the key data on student numbers, courses, research performance, etc., and the specific achievements of our institution throughout the past academic year. It responds to two of the URV’s main objectives: first, to make society aware of our mission; and second, to explain how the budget and resources provided by the Catalan government and other institutions have been used. For the first time, the Overview Report has been designed according to the new framework, fulfilling the objective of bringing the SDGs to the attention of society as a whole.

This paper will present the two documents in question and the specific actions undertaken to contribute to the SDGs in Agenda 2030.

Introduction
Universities may not have been able to meet the call of the Millennium Goals for the year 2000. As a result, we cannot allow the same thing to happen with the Sustainable Development Goals of the United Nations Agenda 2030. Knowledge transmission, research, technology transfer and the dissemination of culture are the instruments that will best contribute to the more sustainable development of the world, and universities use them all. In addition, public universities, which are funded by the society we serve, have an inescapable duty to return this investment to society in the form of intellectual progress and tools for social welfare.
Therefore, Agenda 2030 offers us a great opportunity to contribute to the achievement of its goals.

In this regard, Rovira i Virgili University has made the 17 Sustainable Development Goals its own, aligning its governance action to the SDGs at all levels, from the Governing Council to the teams that govern the URV’s decentralized faculties, schools, departments and research institutes.

To carry out this alignment, the URV has drafted a strategic plan and used two additional instruments to reflect the URV’s actions and accountability: the Rector’s Annual Report to the University Senate (an internal document for the highest representative body of the university community) and the Overview Report, which is aimed at the university and society as a whole. We shall now go on to describe each in greater detail.

### Putting our Strategic Plan into Action

The Strategic Plan of the URV for the period 2018-2022 contains seven strategic lines, thirty objectives and 143 actions. Each of the strategic lines is aligned with the corresponding Sustainable Development Goals (Figure 1).

#### Integration into the Rector’s Action Plan

Action has been taken in the seven strategic areas identified in Figure 1: teaching, research and knowledge transfer, people, internationalization, social commitment, governance, and students and employability. To achieve better quality education, the URV has undertaken a number of actions such as enhancing transversal training, encouraging teamwork and stimulating critical thinking at all academic levels (bachelor’s degree, master’s degree and doctorate) and it has promoted lifelong learning among former students and retired staff. It is clear to us that if we are to improve education, the working conditions of university employees must also be improved and every effort must be made to reduce inequalities. In a globalized world, the URV wants to be connected at the global and local levels. We have recently joined the Aurora alliance of European universities, which aims to provide high quality education and research. Aurora’s main objective, however, is to transfer knowledge to build a better society. This is the exact same purpose of the URV, which aims to establish a very close relationship with our region and local industry through industrial doctorates and employability forums. In addition to these actions, a clear determination to cultivate and promote ethical values in education, research and transfer has culminated in the URV’s new code of ethics.

The URV’s pertinent actions appear in Figure 2.
The Overview Report responds to our social responsibility by accepting that we are accountable to the society that sustains us and by explaining the results of our activity. The general public places their trust in us and makes a portion of their taxes available to us; in return, the URV gives society knowledge and culture to achieve progress and well-being. The document is printed in three languages—Catalan, Spanish and English—so that it can be read by organizations and individuals not only at the local and regional level but also at the national and international level.

**Reporting Our Actions to the Community**

If the SDGs are to be achieved, the plan needs to belong to everyone. Therefore, detailed information is provided on the precise actions that are underway. These actions are reported both inside and outside the institution through the two main instruments mentioned earlier.

**The Rector’s Annual Report to the University Senate**

The Rector’s Annual Report summarizes the actions carried out during the academic year, and these actions are aligned to their corresponding SDGs. In the last academic year, 2018-19, the URV launched 106 actions to carry the strategic lines into effect. They were all approved by the Senate. In the same session of the Senate, attendees were invited to have a coffee and asked how they believed the URV should go about achieving the agreed goals. Groups were formed to work permanently on each of the SDGs. The event was called the Coffee of Ideas.

Members of the university community chose the URV’s top priorities: SDG 3 (good health and well-being), SDG 4 (quality education), SDG 5 (gender equality), SDG 12 (responsible consumption and production) and SDG 13 (climate action).

**The Overview Report**

The Overview Report is the document that summarizes the key data on student numbers, courses, research performance, etc., and the specific achievements of our institution. For the first time, the document has been designed according to the new framework, fulfilling the objective of bringing the SDGs to the attention of society as a whole (Figure 3).

**The Facts**

In the final analysis, what really matters are the actions that turn intentions into reality.

“[To achieve better quality education, the URV has undertaken a number of actions such as enhancing transversal training, encouraging teamwork and stimulating critical thinking at all academic levels (bachelor’s degree, master’s degree and doctorate) and it has promoted lifelong learning among former students and retired staff](#): We have implemented new double degree programmes to increase transversal training and added six online and fifteen blended master’s degrees to grant wider access to the University. To encourage teamwork and critical and innovative thinking, we have created the Debate League and the Social Engagement Office. The Master’s Degree in Development Cooperation and Social Transformation is an example of the promotion of lifelong learning and it is made available to former students through the alumni programme and to retired University staff through the Iubilo programme.

“It is clear to us that if we are to improve education, the working conditions of university employees must also be improved and every effort must be made to reduce inequalities”. Together with our efforts to increase online resources, we have stabilized 68 administrative positions and injected 50 new PhD scholarships per year into our research network. In terms of research and our commitment to the SDGs, the Doctoral School has aligned our research lines with the 17 SDGs to show how they are affected. The URV now has a strong ranking in terms of the SDGs in the THE University Impact Rankings. Also, a highly successful initiative to reduce inequalities can be seen in the Inserlab project, in which students with intellectual disabilities work on specific projects with the ultimate aim of finding employment.

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**Figure 3:** Figure 3. Front page of the URV Overview Report 2020
“In a globalized world, the URV wants to be connected at both the global and local levels”. We have implemented a third language promotion plan, which is personalized for each new student. The objective of the plan is for every student, during their time at the URV, to increase their linguistic competence in relation to their initial level. As mentioned above, membership in the Aurora network will boost internationalization at all levels. “Internationalization at Home”, based on technologies such as collaborative online international learning, is a tool that can combine internationalization and the reduction of inequalities, because it allows anyone to have an international experience.

“This is the exact same purpose of the URV, which aims to establish a very close relationship with our region and local industry through industrial doctorates and employability forums”. The URV connects to the region through the creation of rural co-working groups, transversal degree courses that provide tools for entrepreneurship, and a strategy driven by the Doctoral School that links master’s degree research projects with doctoral theses prepared in association with local industries within the framework of the so-called “Industrial Doctorate”.

Training and Dissemination

We have grouped the terms “training” and “dissemination” together because, although they differ in meaning, we consider them equally important in relation to the ability of the University, as a whole, to tackle the SDGs. There might be a gap between our perception of the importance of the SDGs and our understanding of how to improve them. This is why dissemination has the double purpose of informing people but also educating the university community about the SDGs.

The URV’s commitment to the SDGs also involves dissemination, which is why we have designed an easy-to-use, hand-delivered leaflet, which explains what action the URV is taking in relation to each of the 17 SDGs and invites society in general, to whom the leaflet is addressed, to think about how it too can contribute at an individual and collective level. The leaflet is published in Catalan and English for maximum dissemination.

These actions and projects are disseminated locally and internationally: as part of the Aurora network, the URV’s Inserlab project was awarded a prize for its impact on society; in Africa, the URV is engaged in a collaborative project in Mozambique to promote educational and research activities to fight undernutrition; closer to home, the URV presides over the Vives Network of Catalan Universities; and in China, the URV has a close connection with Chinese universities due to the significant presence of Chinese students in our university.

Conclusion and Challenges

The Sustainable Development Goals have become part of the URV’s DNA. This has been an easy process for the Rector’s team, whose action programme is based on many of the values that have also inspired the SDGs: ethics, professional responsibility, lifelong learning, research with a social impact, equality, sustainable development, health, equity and attention to people with socioeconomic difficulties, among others. However, the challenge now is to involve the whole university community – undergraduates, doctoral students, lecturers and staff – to work toward attaining the goals, and the first step must undoubtedly be for all day-to-day actions to align with the SDGs. That is how the awareness of their importance will spread and added value will be given to our raison d’être as a public university.
The Planetary Wellbeing Project as a Cross-Cutting Strategy to Achieve the SDGs

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Abstract

The Pompeu Fabra University (UPF) is a public, international, research-intensive institution that has earned a place among the best universities in Europe in just 29 years. Its model is based on quality teaching and excellent research with international reach. It has a high position in international rankings, according to the Times Higher Education World University Rankings (2019), the Times Higher Education Young University Rankings (2019) and U-Multirank (2019). The UPF was ranked 29th worldwide for its impact in relation to the United Nations’ Sustainable Development Goals (SDG), and it stands out in the promotion of gender equality (ranked 8th in the world), reduced inequalities (16th) and quality education (35th), according to the Times Higher Education University Impact Rankings (2019). In this article, we explain three projects that we believe are fundamental to tackling SDG implementation that have a high impact potential as they continue to develop.

Extensive work on Gender Equality: Equality as a Matter of Quality

The Equality Unit at the UPF drives action on gender equality by advising governing bodies and promoting gender mainstreaming across university policies. It supervises implementation of the institution’s Equality Plan by academic and administrative units and services. It also manages protocols in cases of gender-based violence and LGBTI-phobia that affect members of the university community. This Unit organises three Equality Weeks throughout the academic year to raise awareness on gender inequalities and to promote free expression and respect for diversity in sexual orientation and gender identity.

As an expression of the UPF’s responsible research and innovation, the university has several research groups that specialise in gender studies or produce gender-sensitive research. Research in this field is also promoted at undergraduate and graduate levels with prizes awarded to the best bachelor’s and master’s degree final projects and PhD dissertations on gender-related topics. At undergraduate level, the prizes are awarded annually and at graduate level they are given every two years.
An Institution-Wide Project: Planetary Wellbeing

In 2018, the UPF introduced the Planetary Wellbeing initiative at institutional level. This is a strategic proposal designed to generate and transmit new knowledge to tackle the major challenges facing global society in the twenty-first century. The novel concept of Planetary Wellbeing, which is understood as an integral goal of humanity’s development, is based on evidence that human welfare (in a broad sense) is strongly dependent on the environmental and natural balance of the planet, and on the solidity and legitimacy of the political, economic, legal and cultural institutions of society.

In the last century, humanity has made great advances in improving individual wellbeing. However, this progress has come at a cost: an unprecedented rate of exploitation of natural resources and unacceptable inequalities in health and wealth. The most recent studies on the evolution of climate change and the degradation of environmental resources show we are facing a global emergency that requires a range of transformative actions. The UPF has decided to focus its energy on responding to this situation, which poses challenges in the university’s various fields of knowledge and education: from health, biology, politics and economics to humanities, engineering, law and communication. To this end, the UPF is launching a university-wide inter- and transdisciplinary project to find the support required to offer solutions to governments, companies and institutions worldwide.

This project is closely related to the SDGs, particularly those associated with the biosphere and health. The Planetary Wellbeing project aims to coordinate and apply SDGs through the project’s strategic proposals that incorporate research activities, teaching activities, institutional policies and dissemination activities. The UPF is firmly committed to assuming its responsibility as a centre of international excellence in research and teaching in relation to these planetary goals. In the short period since Planetary Wellbeing was established, the following achievements have been made.

1. Governance and Institutional Policies

An institutional declaration of climate emergency was made in May 2019 and a roundtable on Climate Emergency was held. The UPF supports the Climate Emergency Letter, which states the commitment of over 160 universities to combat climate change. The UPF has also become an observer at the COP25. The university has incorporated environmental, social and gender criteria in its service contracts, energy savings in its ventilation systems, in electricity and water consumption. It has given social entities and public centres the right to use the IT equipment and supports student activity on environmental and social aspects of sustainability.

The Climate Emergency declaration in May 2019 led to the creation of an impact plan to minimize the environmental impact of the universities’ activities. The university’s carbon footprint was also calculated. The aim is to convert the UPF campuses into living sustainability labs (SDG7, SDG11, SDG12 and SDG13). Although these are top-down measures, some initiatives are generated in the community and then scaled up, which creates active, rich, bottom-up communication. One example is a Zero Waste Initiative promoted by a specific administrative unit, which served as a pilot and will be adopted by the rest of units. Other examples of bottom-up initiatives are the drastic reduction of plastic bottled water on campus and the implementation of the Menu for the Planet, both initiatives promoted by student organisations.
2. Teaching Initiatives

The UPF is developing its teaching model to become more flexible and transdisciplinary and to collaborate more with society, organizations and companies. Collaborative knowledge and synergies are being generated between teaching and research (SDG4 and SDG17). Similarly, the UPF is creating synergies at European Union level through the EUTOPIA alliance between the universities of Paris Seine, Brussels Vrije, Warwick, Ljubljana, Gothenburg and Pompeu Fabra. The aim of this alliance is to create a connected, inclusive community that seeks to address local and global challenges and ultimately contribute to creating a new model for higher education in Europe through collaborative research, greater student and teacher mobility and shared innovations, among other factors. Accordingly, the alliance will receive up to €5 million in the coming three years to start implementing its plans and pave the way for other higher education institutions across the EU to follow.

The UPF gives a wide-range of awards with prize money to the best final projects on Planetary Wellbeing at undergraduate and master's degree level and a biannual award for the best doctoral thesis on this subject. For economics and business students, there are additional specific awards for the best undergraduate final projects on Corporate Social Responsibility.

3. Research and Dissemination

Research actions are developed and coordinated by a Planetary Wellbeing Task Force with some members of the community. Every year, the Task Force holds plenary sessions that are open to many researchers. At these sessions, the impact of the measures is evaluated and discussed and new research is presented.

One of the main actions has been a call for project proposals on Planetary Wellbeing, with funding of €146,000 available. A total of 73 interdisciplinary proposals were received and funding was allocated to 14 of them in the fields of health, biology, politics, economics, humanities, engineering, law and communication (SDG3, SDG8, SDG11, SDG12, SDG13, SDG16 and SDG17).

Some UPF units, policies and research projects have gained momentum due to the Planetary Wellbeing strategy. They include the Responsible Research and Innovation (RRI) policy at UPF that promotes diversity, inclusiveness (SDG5), openness and transparency; the creation of a Research Group Network that interconnects findings in the fields of science, culture, politics, religion and society on notions connected with sustainability; the UPF Center for Animal Ethics that creates ethical principles for animal treatment; EU Sustainable Project policy recommendations, as disseminated across Europe; and the Center for Sustainability Studies that brings together teaching staff from all UPF departments to promote interdisciplinary contact that can be translated into integrated teaching, new interdisciplinary research and the organization of dissemination activities on sustainability-related topics. Ongoing collaborations have been established with NGOs that generate synergies on sustainability, such as food waste management with a social company called Espigoladors.

Many activities have been organized to disseminate the project. For example, for World Environment Day on 5 June, a poster competition on Planetary Wellbeing was held for university students and a Planetary Wellbeing Day was organized for the community. Other events that were held are the fifth edition of Global Climate Change Week 2019 and Humanistic Dialogues on Planetary Wellbeing. Sustainable Week and Healthy Week were created as awareness-raising activities and permanent or specific campaigns have been established such as recycling mobile phones and general recycling. Additionally, the institutional magazine, 360upf, published a monography on Planetary Wellbeing.
The Old Fish Market and the Citadel of Knowledge: Creating Alliances (SDG17)

The Pompeu Fabra University aims to use the Old Fish Market as part of its interdisciplinary strategic initiative to position itself as a global leader in the new discipline of Planetary Wellbeing. The commitment of public administrations and/or private donors would enable the UPF to create a Research and Innovation Centre for Planetary Wellbeing where interdisciplinary research could take place, to go beyond excellence and produce changes and a substantial, real, tangible impact on the world. This Research and Innovation Centre will focus on improving and sustaining health and quality of life. When established, its activity will be structured around the following six areas:

1. Global Health (environmental pollution and health, climate and health, urban health, child health, aging and complex diseases)
2. City Science (sustainable cities, mobility, technology, energy, sociology and interculturality)
3. Global Governance and Global Challenges (global regulation and policymaking, state and global governance, economy, equity, poverty and global security)
4. Data Science and Digital Technologies (big data analysis, data sharing, augmented reality, virtual reality, artificial intelligence and blockchain)
5. Complex Systems (biodiversity, ecosystem engineering, bioengineering, new materials and cognition)
6. Meta Research (management of the complexity of missions in science, pathway to impact methodologies, and management of change)

Additionally, a Barcelona based-project, the Ciutadella del Coneixement (Citadel of Knowledge), aims to shape the neighbourhood in an area of high-impact research that would involve several nearby research-oriented institutions. The idea is to foster synergies in the fields of biomedicine, biology, economics, political science, law, humanities and technology.

The Ciutadella del Coneixement is a scientific and urbanistic project that aims to turn the Ciutadella Park area, near the coast in central Barcelona, into a unique urban knowledge hub in Southern Europe. The first action of the wider initiative of the Citadel of Knowledge is directly promoted by Pompeu Fabra University (UPF) with other strategic partners. It consists of the creation of a new research and innovation complex of almost 46,000 m² to be located on the grounds of the Old Fish Market. In other words, this project is the key to a much broader project, serving to unlock multidisciplinary research and innovation committed to important, urgent objectives of the planet.

The new buildings will incorporate the latest techniques to minimize acoustic and environmental pollution and provide for the sustainable management of water, waste, energy and the mobility of occupants. The objective is to go beyond sustainable buildings to regenerative buildings, as an inspiring model for a city that respects nature and is integrated with it.

Construction at the Old Fish Market area is scheduled to begin in March 2021 and finish in December 2023. The total construction costs of the planned buildings in the Old Fish Market area will be approximately €92.8 million.
Conclusions

As explained, the UPF approach to the SDGs is based on decisive gender equality policies (SDG5) across the institution, research and teaching, and a strategic institutional project on the concept of Planetary Wellbeing, which is broad enough to integrate various academic perspectives.

The potential of Planetary Wellbeing will be demonstrated in coming years. It will be evaluated by the capacity to scale up and generate innovative interdisciplinary research that can produce substantial changes and make a real and tangible difference in the world. At the same time, the university incorporates the SDGs as the current international agenda on sustainability and, when the time comes, it will be aligned with forthcoming humanity challenges.
PART IV – Key Competencies
Approaches for Sustainability
Campus Action: Testing Sustainable Development Goals on Higher Education Students

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Abstract
Higher education has an important role to play in reinforcing the Agenda 2030 Sustainable Development Goals (SDGs). Making students more aware of sustainable development and getting them to work on real-world experiences related to the environment and society’s problems may help them to empower responsible future decisions. This paper presents a documented experience of higher education students carrying out a social entrepreneurial project to solve identified social problems or needs in the territory where their university operates. A survey on individual dynamic capabilities (IDCs) and commitment to sustainable development (SD) was administered to 263 higher education students before and after the project in order to identify whether their IDCs and commitment to SD increased. The research also sought to determine which IDCs had a higher impact on SD commitment. The results show that the IDCs and SD commitment increased after the project and that the IDCs helped students to become more committed to the territory’s sustainability. Making students more aware of sustainable development and getting them to work on real-world experiences based on the environment and society’s problems may help them to become change makers and sustainability citizens. This research would be useful to anyone interested in enhancing SD by involving higher education students in a project that responds to an area’s social and environmental needs.

Introduction
In 2015, countries adopted the Agenda 2030 for Sustainable Development and its 17 Sustainable Development Goals (SDGs) to promote prosperity while protecting the planet. They accepted that ending poverty must go together with strategies that build economic growth and address a range of social needs, including education, health, social protection and job opportunities, while also addressing climate change and environmental protection. Thus, the UN has launched a global challenge to which every member state is committed. If one thing has been made even clearer by the UN resolution, however, it is that sustainability is not only about environmental issues. It is also about two other cornerstones that have previously been blurry but are now coming into sharper focus: social issues and economic issues.

Education has an important role to play in teaching a new vision of education on sustainability or education for sustainable development (ESD) (Rieckmann, 2017). Under this new paradigm, education should foster the right types of values and skills that will lead to sustainable and inclusive growth and peaceful coexistence. The acquisition of competences for sustainable development by students will lead to a higher commitment to sustainability and the SDGs (Fadeeva et al., 2010; Cebrián et al. 2015; Wiek et al., 2015). The SDGs are being introduced in research programmes and higher education curricula and they are being put into practice in many
actions undertaken on university campuses in order to educate for sustainable development (Giadotti, 2010; W. Leal Filho et al., 2018).

This research presents a practical case based on the real-world experience of an entrepreneurial project proposed to higher education students. The project consisted of bringing ideas to solve a specific area’s problems concerning sustainable development and the SDGs. A survey on competences for sustainable development and on sustainable development itself was carried out before and after the project in order to check which competences, if any, increased as a result of real-world practical experience. The SDGs involved in the practical case are SDG 8 on decent work and economic growth, specifically “promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all”; SDG 9 on industry, innovation and infrastructure, specifically “build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”; SDG 11 on sustainable cities and communities, specifically “make cities and human settlements inclusive, safe, resilient and sustainable”; SDG 12 on responsible consumption and production, specifically “ensure sustainable consumption and production patterns”, and lastly SDG 17 on partnerships for the goals, specifically “strengthen the means of implementation and revitalize the global partnership for sustainable development”.

After the introduction, this paper is organized into four sections. The first section sets out a literature review of competences for sustainable development. The second section describes the methodology, including the sample, measures and statistics. The third section puts forth the results and the final section offers conclusions, together with recommendations.

1. Literature Review on Competences for Sustainable Development and the SDGs in Higher Education

A competence is more than knowledge and skills. It involves the ability to meet complex demands by relying on and mobilizing psychosocial resources (including skills and attitudes) in a particular context. However, Boon and van der Klink (2002) and Lozano et al. (2012) note that there is no consensus around the definition of competences in higher education.

Competences for sustainable development (SD) are related to education for sustainable development (ESD). ESD takes a holistic approach, because it is not simply a matter of introducing topics on climate change, poverty and consumption in the curriculum; it also requires a shift from teaching to active learning (Elam and Trop, 2010; Rieckmann & Gardiner, 2017; Mintz & Tal, 2018). In addition, ESD takes into account the environment, the society and the economy in a broad sense (Sinakou et al., 2018), while competences for SD enable students to become “sustainability citizens” (Wals and Lenglet, 2016). In this sense, there are a wide range of competences that could be considered as enablers of SD. Wiek et al. (2015) defined five key competences for sustainability: systems thinking, anticipatory thinking, normative thinking, strategic thinking and interpersonal thinking. Cebrián and Junyent (2015) developed a theoretical framework for professional competences in ESD and laid out seven key elements: future or alternative scenarios visioning; contextualizing; working and living with complexity; thinking critically; decision-making, participating and acting for change; clarifying values; establishing a dialogue between disciplines, and managing emotions and concerns. Rieckmann and Gardiner (2017) established the following competences for SD: systems thinking, anticipatory thinking, normative thinking and strategic thinking; collaboration; critical thinking, self-awareness, and integrated problem solving. The entrepreneurial skills of individuals have been shown to be related to their social and environmental commitment (Fabregá et al. 2016). Individual dynamic capabilities (IDCs) have also been shown to have an impact on the commitment to sustainability of the individuals who possess them (del Mar Alonso-Almeida et al., 2018). For this reason, some universities have included entrepreneurial skills and individual dynamic capabilities in their education programmes. Other research has focused on establishing pedagogical approaches that develop competences for sustainable development (Cebrián and Junyent, 2015; Lozano et al. 2017; Lozano et al. 2019, Bull-Fabregá et al. 2019).

Based on the literature review, we propose the following model and five related hypotheses to be tested:

Figure 1. Model to be tested
The dependent variable in the model is Sustainability, while the independent variables are Sensing, Seizing, and Transforming, considered as components of individual dynamic capabilities (IDCs).

The hypotheses to be tested focus on whether there will be:

H1: Significant differences in the Sensing variable between before and after the programme.
H2: Significant differences in the Seizing variable between before and after the programme.
H3: Significant differences in the Transforming variable between before and after the programme.
H4: Significant differences in the Sustainable Development variable between before and after the programme.
H5: There is a positive correlation between the independent variables and the dependent variable.

Methods
Sample and data collection

The practical case based on a real-world experience was intended to provide information to analyse whether IDCs, such as competences for sustainable development, may increase commitment to SD through the implementation of a three-month intensive programme from April to June 2018. Before and after the programme, a survey in Spanish and English was administered to students to evaluate the programme's impact, as other authors have done in previous studies (Cohen et al., 2018). The programme participants were 263 students attending entrepreneurship courses at the TecnoCampus Advanced College of Social and Business Sciences at Pompeu Fabra University. Of the total, 76 were first-year students in Business Administration and Innovation Management, 68 were first-year students in Business Administration and Innovation Management taught in English, 57 were third-year students in Marketing and 62 were students in the first double degree in Business Administration and Marketing. Lambrechts et al. (2013) have also analysed the integration of competences for sustainable development in bachelor's degree programmes in management.

The subject “Entrepreneurship”, which is worth 6 ECTS credits, is compulsory. It is taught by three professors and alternates between conceptual and procedural classes. In order to validate the hypotheses formulated by the present study, the programme was linked to the real needs of three towns in Maresme (which lies within the UPF’s area of influence) so as to provide the towns’ governments with design prototypes and evaluate their possible implementation in the future.

Measures

The survey had two sections: one on IDCs and the other on sustainable development. The individual dynamic capability of Sensing was defined as the identification and evaluation of opportunities, while Seizing was defined as enacting the identified opportunity to create value and Transforming was defined as continuous innovation (Teece, 2012). The questionnaire on the IDCs was designed by adapting items from previous studies (Kucel et al., 2016; Tang et al., 2012; Wilden et al., 2013).

To evaluate the level of sustainability, the questionnaire used adaptations of Carracedo et al. (2018) and Sulitest (Decamps & Aurélien, 2017). Sulitest is a free tool for all higher education students regardless of their branch of study, and it is in widespread use in the university environment.

The survey was not compulsory, but any students who responded before the project undertook to respond after the project as well. The survey was anonymous and it was not possible to identify any direct relationship between the two surveys completed by each student.

Statistical analysis

A longitudinal analysis was performed on the same students before and after the three-month practical case. The statistical tool that was used is SPSS 25.

Two statistical analyses were carried out. The first was the Student’s T-test to analyse whether the variations of the means for the Sensing, Seizing, Transforming and Sustainable Development variables between the two points in time were significant. The p-value was checked to determine whether there was a significant difference between the average of the variables at the two times: before and after the greening campus practical case. The p-value has been calculated with a confidence level of 95% and a 5% margin of error.
The second analysis was a correlation test between the independent variables (the three individual dynamic capabilities) and the dependent variable (Sustainable Development), which was only analysed at the second point in time, that is, when the students had completed the entrepreneurial project.

Table 1. P-values for the Sensing variable.

The results of the p-values for the Sensing variable appear below in Table 1. Of the 9 items that address the Sensing variable on the administered survey, 6 have significant differences between before and after the project. Therefore, H2 is accepted.

Table 2. P-values for the Seizing variable.

The results of the p-values for the Seizing variable appear below in Table 2. Of the 9 items that address the Seizing variable on the administered survey, 6 have significant differences between before and after the project. Therefore, H2 is accepted.

Table 3. P-values for the Transforming variable.

The results of the p-values for the Transforming variable appear below in Table 3. It is possible to confirm that there are significant differences in 4 of the 6 items on the questionnaire between before and after the project. Therefore, H3 is accepted.

For this variable, the values for all items have increased. In addition, 67% of them show significant variation. This means the Transforming variable is where the application of the programme has had the most positive impact.

Table 4. P-values for the Sustainable Development variable.

The results suggest that a real-world entrepreneurial programme developed in conjunction with a territory in order to achieve social impact increases students’ IDCs, with the most significant variations occurring in the Transforming variable. The fact that the Seizing variable is the one that has the fewest items with significant variations indicates that the pertinent increases might be the result of other factors, not necessarily the implementation of the programme. This may relate to the constraints imposed on the students’ project (e.g., the project must address a particular territory, it should have social impact, etc.), which may have given rise to variations that were not the result of the project itself, suggesting that the students might not have been as creative as they could have been.

In the case of the Sustainable Development variable, all items increased and showed significant variations. Therefore, the implementation of the project and the improvement in the independent variables has led to an increase in commitment to sustainable development and H5 is accepted. These results suggest that working on the IDCs could generate improvements not only in the IDCs but also in commitment to sustainable development. The programme’s intervention has had an effect on each of the independent and dependent variables.

**Conclusions**

The main contribution of this research is that working on real-world experiences that address social needs through partnerships rather than on environmental issues helps to increase competences and commitment to sustainable development. Moreover, this is one of the first studies not only to set out a practical case and its development, but also to carry out a statistical analysis to demonstrate that the implementation of a project makes a difference in specific variables relating to competences and commitment to SD. More specifically, it shows that the active and reflexive learning taught to students through the Design Thinking methodology, through project work, and through a challenge in their territory are the items that appear to be connected to an increase in the students’ commitment to SD. Engaging the university community and especially students to bring forward ideas to help local society is crucial to fostering sustainable development. In this regard, taking the context into account is a powerful tool to generate greening activities that meet the local needs of the community.
The research also gives rise to a number of recommendations, some of which are directed at higher education institutions. The first recommendation is to keep focusing on education for sustainable development in order to prepare students who will work toward a healthy environment and better societies by fostering a commitment to the SDGs. The second recommendation is that commitment to sustainable development can be learnt through working on a project. The empirical evidence suggests that entrepreneurial courses and programmes facilitate the acquisition of such skills (Fabregà et al., 2016), which emphasize critical thinking and innovative problem solving as key elements in seeking to respond urgently to the environmental and social problems of contemporary globalized societies. The third recommendation is that establishing local networks with university stakeholders is a good method to engage the community in obtaining mutual benefits from sustainable development.

The research has some limitations. The first limitation relates to the sample. The data come from a particular university and may not be representative of others in the same country or in other countries. The second is that similar research should be done in other universities to compare results. The third is that the study was conducted in 2018-19 and the results might be different in another period.

Some future research lines arise from the research. First, it is necessary to continue studying the effects of competences for SD on other variables, such as the uses of big data, social media and stakeholder engagement. Second, it could be interesting to analyse the results related to the learning of SD when using other active methodologies, for example, the flipped classroom, and to identify any relationship between methodologies and competences for ESD. A third and final area would be to analyse any possible differences by gender, municipality, country and so forth.

References


Abstract

In recent decades, education policy has been preoccupied with economic growth while paying too little heed to the challenges of global sustainability. International initiatives to promote education for sustainable development (ESD) have been hampered by a lack of clarity on how to implement this form of education (Vare, 2019). In an attempt to address the issue, an Erasmus-funded three-year project called A Rounder Sense of Purpose (RSP) was established to develop a practical accreditation model for educators working on ESD. Expert and user opinions were sought through several rounds of structured consultation with over 500 people, chiefly using a Delphi approach to develop and validate the model. The resulting framework comprises 12 competences, each with three learning outcomes and several underpinning components, and is supported by a range of activities that largely reflect a constructivist pedagogy. A range of assessment techniques are currently being piloted within the project. Ultimately, it was decided not to design a single qualification template because defining the award at such a level of detail would make it more difficult to apply across multiple jurisdictions. Partners also felt that such an approach would atomize learning in a way that runs counter to the holistic principles of sustainability. RSP provides a rich learning experience for those involved and has already demonstrated its potential to extend its impact well beyond the original participants.

Introduction

In 2015, UNESCO launched the Global Action Programme (GAP) on Education for Sustainable Development (ESD) linked to the 17 Sustainable Development Goals (UNESCO 2015). The “Education for All” and the “Education for Sustainable Development” agendas came together in Sustainable Development Goal (SDG) 4, “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”. Under SDG 4, there is a specific reference to ESD in target 4.7: “By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development.” However, as stated by the International Network of Teacher Education Institutions (INTEI), ESD is essential for achieving not only SDG 4, but also all of the other 16 SDGs. All work related to education, public awareness, understanding and training should contribute to making progress towards all SDGs (INTEI New Year’s Email 2018).
Developing Teacher Competences in ESD

There had been models of teacher competences that support ESD for several years prior to the launch of the Global Action Programme (De Vries et al 2018). Probably the best known is the model put forward by the United Nations Economic Commission for Europe (UNECE 2010). The UNECE model presents 39 competences in a 3x4 matrix with the three columns headed: Holistic Approach, Envisioning Change and Achieving Transformation. The four rows, which are based on the Delors publication “Learning the Treasure Within” (UNESCO 1996), are entitled: Learning to know, Learning to do, Learning to be and Learning to live together.

The UNECE competences, although clearly defined and well underpinned, are not easy to put into practice. Three reasons for the difficulty are: there are too many of them, some are rather abstract, and they are not all applicable to every teaching context. One explanation for these issues may be that there was no opportunity to test the competences in practice before they were published and, as a result, they cannot be readily implemented. Similarly, another well-articulated model by Sleurs (2008) is too complex to be readily interpreted and applied in most settings where teachers already face a heavy workload.

The challenges listed above are also faced by lecturers in ESD, coordinators of sustainable development in teacher education institutions (TEIs) and promotors of ESD, e.g. the Dutch NGO Duurzame PABO (which means “Sustainable TEI” in English). Attempts to overcome these challenges are met with frequent requests from colleagues and students for simplification, for example: “Please can you summarize and simplify this on one side of A4?” Consequently, the competences have been debated in many meetings with TEI colleagues (e.g. Toronto 2011, Nagoya 2015) and in several meetings of the Learning Teacher Network (e.g. Lisbon 2012 and Istanbul 2014).

In the Netherlands, Duurzame PABO published a translation of the UNECE competences for primary school teachers and teacher education students (De Hamer & Leussink, 2012). The translations were specific to the teaching profession and practical examples were provided. However, the teacher comments remained: “Too complex, too many competences”.

Towards a Revised Set of ESD Competences: The RSP Project

In the Erasmus+ project “A Rounder Sense of Purpose” (RSP) coordinated by the University of Gloucestershire, six partner organizations, specifically the University of Gloucestershire (UK), Duurzame PABO (The Netherlands), Frederick University (Cyprus), the Hungarian Research Teachers’ Association (Hungary), the Italian Association for Sustainability Science (Italy) and Tallinn University (Estonia), worked collaboratively to seek solutions to these challenges. The UNECE framework was analysed and examined for overlap and redundancies, and a distilled version of twelve core competences was created. This framework retains the UNECE framework’s 3x4 matrix but re-labels the rows “Integration”, “Involvement”, “Practice” and “Reflexivity”. On reflection it was felt that this format was still too rigid, so the RSP competences are generally presented as lying on an artist’s palette to highlight the fact that they should not be viewed discretely but rather as overlapping and complementary. The framework was tested using a Delphi research procedure and after some subsequent tweaking is now user-ready.

A website, which is built and hosted by Duurzame PABO, contains the framework, theoretical background, project overview and sample activities, which can all be found at https://www.aroundersenseofpurpose.eu.

Delphi Research among Peers

The testing was done in the Netherlands using a Delphi procedure (Van Aken et al 2011) in which individual contributions were shared among participants in order to evaluate the results and formulate next steps. The procedure continued until the participants’ various results led to a level of consensus. An added complication for partners such as the Dutch was that the competences were originally drafted in English and therefore had to undergo translation, which can lead to subtle differences in interpretation and meaning. While unavoidable, this was considered acceptable provided that the results reflected the spirit of the original text and the competences remained usable.

In the first stage of the Delphi research project, partners discussed the concept of the twelve competences with experts in the field, mostly lecturers, managers and coordinators. The discussions took place on several
occasions, and content, comprehensibility and applicability were all identified as issues.

The results were discussed over two rounds of engagement leading to adjustments in the competence statements, guidelines, levels and assessments.

Delphi Research among Peers

In the second stage of testing, the draft RSP competences were used with students in the final year of their TEI studies. After being presented with the competences and discussing them, students engaged in activities to improve specific competences with support from their peers. During these sessions the competences were again critiqued. Then the results were discussed among the project team. The Delphi research led to improvement of the text (clarification) and adjustments to make the text easier to understand (simplification). It also highlighted the very important notion that schools, institutes and nations differ. Therefore, the procedures, guidelines and assessment strategies had to avoid being too context-specific and prescriptive.

The Framework

The resulting framework (Fig. 1) is further subdivided into learning outcomes (available on the project website), but it was decided not to break down the framework even further into skills, values and knowledge. Rather than giving a detailed breakdown of attributes, the framework provides twelve sets of underpinning components linked to the learning outcomes of each competence. The RSP website (aroundersenseofpurpose.eu) also provides a growing number of suggested and tested training activities that will help to develop the underpinning components and learning outcomes for each competence. Many of these activities have been developed by teacher education students.

<table>
<thead>
<tr>
<th>Component</th>
<th>Describing Change</th>
<th>Advancing Transformation</th>
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<tbody>
<tr>
<td>Strategy</td>
<td>Future</td>
<td>Participation</td>
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</tbody>
</table>
| Material | "The educator helps learners to develop a meaningful understanding of the world as an interconnected whole and to consider the consequences of their actions on others, societies and the environment." | "The educator helps learners to take action to contribute to the sustainable development of their community, their nation and the world."
| Resultant | "The educator encourages learners to improve their understanding of the concepts of change and development through the multiple relationships between the personal, social and natural worlds." | "The educator helps learners to identify and take action to contribute to the sustainable development of their community, their nation and the world."
| Value | Clarify | Evaluate |
| Opportunity | "The educator encourages learners to reflect on the relationship between their actions and those of others, and to consider the consequences of those actions." | "The educator helps learners to reflect on the relationship between their actions and those of others, and to consider the consequences of those actions." |
| Value | "The educator encourages learners to act in a socially responsible manner, and, in particular, to consider the consequences of their actions on others, their community and the environment." | "The educator helps learners to act in a socially responsible manner, and, in particular, to consider the consequences of their actions on others, their community and the environment." |
| Responsibility | "The educator helps learners to act collaboratively both within and outside of their own discipline, role, perspectives and values." | "The educator helps learners to act in a socially responsible manner, and, in particular, to consider the consequences of their actions on others, their community and the environment." |
| Envisioning Change | Futures | Participation |
| Strategy | Future | Participation |
| Material | "The educator helps learners to develop an understanding of the world as an interconnected whole and to consider the consequences of their actions on others, societies and the environment." | "The educator helps learners to take action to contribute to the sustainable development of their community, their nation and the world."
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| Reflectiveness | "The educator helps learners to develop a meaningful understanding of the world as an interconnected whole and to consider the consequences of their actions on others, societies and the environment." | "The educator helps learners to take action to contribute to the sustainable development of their community, their nation and the world."
| Resultant | "The educator encourages learners to improve their understanding of the concepts of change and development through the multiple relationships between the personal, social and natural worlds." | "The educator helps learners to take action to contribute to the sustainable development of their community, their nation and the world."
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**Figure 1:** The RSP framework of Educational Competences for Sustainable Development.

The RSP competences can be applied to various International Standard Classification of Education (ISCED) levels. RSP partners have already tested programmes from levels 4 (first-year undergraduate) to 7 (masters). At any given level, there are three stages that might be defined as "degrees of engagement and development." The first of these stages is simply an acceptable level of participation in any given training programme related to the framework, the second requires a demonstration of some practical application of the competences, and the third calls for an effort to facilitate change in one’s own work setting or in the work settings of others.

**RSPII**

The project partnership succeeded in securing EU support to proceed with a new Erasmus+ project "A Rounder Sense of Purpose II", in which the RSP framework is linked to the SDGs, especially as a contribution to SDG4.7. It is expected that linking the RSP framework to the SDGs will make the competences even more applicable to a range of educational contexts.
Implementing sustainable development in education demands a “whole school approach towards sustainability” (Van der Meer, 2017). The RSP competence framework can be used by educators as an instrument for (self-)reflection, development and assessment in that process.

The RSP II project supports educators by linking the twelve competences with the 17 SDGs and providing examples of educational activities. The RSP website will soon present 204 inspiring examples of ready-to-use lessons, projects and learning opportunities for primary and secondary schools as well as for teacher training, in whatever context.

**Figure 2:** On the updated website, the ESD competences are connected with all 17 SDGs

The RSP II project is initiated and coordinated by the University of Gloucestershire, in the UK, with participants from Duurzame PABO, the Netherlands; the Italian Association for Sustainability Science, Italy; the University of Vechta, Germany; Frederick University, Cyprus; the Hungarian Research Teachers’ Association, Hungary; Haute École pédagogique du canton de Vaud, Switzerland; and Universitat Oberta de Catalunya, Spain. For additional information, contact André de Hamer or Gerben de Vries of Duurzame PABO (the Netherlands) at info@duurzamepabo.nl.

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Abstract

Competence development, as well as competence evaluation and assessment, have been major challenges for transformative education. These challenges have been addressed in a three-year EU-funded project called a ‘Rounder Sense of Purpose’ (RSP). In the project, a model of 12 competences has been developed for educators, through a process of distillation from the United Nations Economic Commission (UN Economic Commission) competence framework (Learning for the Future, 2012). A range of implementation activities have been devised to develop these competences and assessment techniques have been drawn up. The experience described in this article was carried out by the Italian partner in the project, the Italian Association for Sustainability Science (IASS), with two groups of educators: teachers from different schools levels and educators working in centres of environmental education and education for sustainable development. A transformative approach to evaluation and assessment was adopted, inspired by the set of competences proposed in the RSP project and using various tools aimed at fostering reflectiveness and openness to change of the educators involved. The preliminary results of the pilot evaluation approach proved valuable in promoting an interlinked process of competence development, awareness raising and transformation. However, reflective learning and evaluation practices remain an area for further enquiry that will be developed and analysed systematically in the eight countries involved in the second phase of the RSP project.

The Project

Evaluation and assessment is a major challenge for sustainability and innovation in higher education. The UN Agenda 2030 and related SDGs that deal explicitly with values cannot be addressed with a reductionistic or positivistic approach but need new practices inspired by a qualitative, transformative concept of evaluation and education. The traditional vision of science characterized by separate, isolated disciplines and a search for objectivity and measurements, even in situations where ‘measures’ in a strict sense are impossible, should be replaced by ‘a new vision characterized by the adoption of a wider vector of research practices, such as trans-disciplinarity, community-based, interactive or participatory approaches’ (Wiek et al., 2012).

Complexity, systemic thinking, participation and collaboration, attention to ‘wicked problems’, future visioning and openness to change are some of the many key constructs that accompany research on education for sustainable development. They require a different evaluation paradigm that is less concerned with quantity and more interested “in quality enhancement and innovative development, open to uncertainty and unexpected events” (Mayer and Dillon, 2016).
“It has often been said that scientific explanation lies in explaining what is complex and visible by referring to what is simple and invisible. But in this way, it would completely dissolve all that is complex and visible, while it is also the complex and visible with which we must deal”
(Morin, 1985).

One of the most important objectives to be pursued is the shift from knowledge-based to competence-based education, as a necessary step to reorient our educational practices and engage ourselves in sustainable education, a term that implies a paradigm shift. “Sustainable Education should be at the same time critical and transformative, consciously values-laden and action based, local and global, participatory while developing autonomy, reflexive and critical thinking” (Sterling, 2001).

The competences that sustainable development educators need to face this challenge were proposed by UNECE in 2011. They were fully revised and operationalized by the three-year EU-funded project A Rounder Sense of Purpose (Vare et al., 2019). The RSP project, involving six countries, developed and implemented a competence model for educators involved in sustainability. The practical framework of twelve educators’ competences, distilled from the UNECE proposal, is organized as an ‘artist’s palette’ (Figure 1) in which the colours/competences are mixed and used by the artist/educator, guided by their sustainable education ideas and practices.

Assessment of competences was also addressed in the RSP project. The aim was to identify and apply competence evaluation methodologies that are consistent with the values underlying the model. The methodologies should stimulate reflectiveness and therefore support the professional development of sustainable development educators, who are agents of change (Schön, 1983).

In particular, the Italian partner participating in RSP (IASS) explored the competences assessment issue to ‘co-create knowledge’ about the values underpinning the evaluation process itself and tools that could be used if the evaluation is to be transformative.

Two groups of educators participated in the Italian study: a group of in-service teachers from different school levels in the Florence municipality, and a group of experienced educators from Legambiente National NGO. They were asked, as part of the evaluation process, to reflect on the validity of RSP competences and how they could be implemented in their professional practices.

The main tools established for the evaluation and assessment process were:
• The RSP 12-competence palette itself, as a guide to introduce a transformative evaluation that is consistent with the aims of the project and Agenda 2030.
• A personal portfolio of evidence, intended to support awareness-building and the construction of each participant’s professional competences.
• The three stages of achievement proposed in the project.
• Self- and peer evaluation.

From a methodological perspective, the evaluation process described in the following six steps was conceptualized and organized to be consistent with, and strongly inspired by, the concepts and values expressed by the competences of the RSP palette. The aim was to search for “constructive alignment” (Biggs, 2003) between the development of competences and their assessment.

a. The starting point of the evaluation process was the need to build empathy, not only among the members of the group but also for each participant educator with themselves. Everyone was asked to try to get in touch with their inner self, with their deeper values and feelings. They were told to present themselves through an environmental autobiography, in which they should first choose an image, a metaphor, of their own experience as a sustainable development educator and then describe what that image means for them, in what sense it represents their working style and what their main educational aims are as an agent of change.
b. The second step was inspired by the need to introduce a systemic vision in the process. Educators were asked to describe the sociocultural system in which they are involved as individuals as well as educators, and to map the main resulting relations, links, connections with institutions, organizations and groups of people they work with.

c. Then, they were asked to use critical thinking and responsibility. They had to choose and tell two or three stories related to real, personal experiences in which they think they applied one or more of the competences proposed by the RSP palette, and to discuss the difficulties they encountered. The focus of this storytelling exercise was to describe the competences that they applied, not the projects and activities that were carried out with learners. So written reports, reflective texts, were collected in which each educator tried to give evidence of how, and at what level, they practiced the 12 RSP competences, or some of them, during their professional activity. Each participant teacher/educator produced 2-3 competence reports, of at least 1500 words each.

d. A further step was self-assessment of the quality of their practices in relation to the whole set of RSP competences, using the three levels of achievement proposed in the project (Vare et al., 2019). This led them to reflect responsibly on their actions and values:

- Level 1: The educator uses the competence effectively and experiments with it carefully in familiar contexts.
- Level 2: The educator reflects on the competence and can use it in new contexts, to face new challenges, and adapt or invent new tools to better exercise the competence.
- Level 3: The educator has mastery of the competence while simultaneously understanding that it is necessary to continue to improve it; they promote the competence among collaborators and can guide a shared path of training, innovation and critical reflection on the competence and good practices associated with it.

e. To complete this process, individual portfolios created by participants through the above steps were shared within each group. Each participant had his/her portfolio assessed by peers chosen from among those who did not work in the same team. Peers were asked to use their participation, empathy and critical thinking competences and apply to their colleague’s portfolios the same three levels of achievement that they used for the self-evaluation.

f. Finally, the results of self-evaluation and peer evaluation were illustrated graphically on a spider-web diagram. The reflective discussions that followed this exercise proved valuable in revealing the difficulties and advantages of using the RSP competences model and in developing a deeper level of reflectiveness and openness to change by the educators involved.

In fact, the self- and peer-evaluation exercise allowed participating teachers and educators to reflect on their own practices and those of their peers and to apply different perspectives. This activity brought to light the main values that guide their actions, and developed an awareness of their choices, of the decisions taken and of the possibilities that they discarded. Comparison with others was an essential element to make educators capable of seeing themselves and their own competences with the eyes of others. This made them more aware of their own level of competence, of competences that are more difficult for them to engage with and those that they find easy to apply in their professional lives.

The ongoing process of implementation and reflection on the RSP ‘palette of competences’ benefited from this kind of evaluation. However, the evaluation process itself was improved by the search for consistency with the competences framework.
"The reflections in the portfolios give clues as to which competences align closely with the participants’ own feelings, and are therefore easily applied in their professional lives, and which are more difficult for them to engage with” (Vare et al., 2019).

A second phase of the RSP project involving eight countries was approved at the end of 2018. Reflective practices and theories on competence development and competence evaluation remains an area for the exchange of experiences and further inquiry.

Abstract


Figure 1: The RSP palette of competences
PART V - Developing Evaluation Tools for Change
Local SDG Indicators: A Collaborative Proposal to Monitor the SDGs and Contribute to Local Appropriation of the 2030 Agenda

Maria Cortada
Barcelona Metropolitan Strategic Plan, Spain

Abstract

Since the beginning of its latest phase, the Barcelona Metropolitan Strategic Plan (in Catalan, PEMB) has become fully committed to sustainable urban development, adopting the SDGs as one of its five principles of action. For this reason, the PEMB decided in September 2018 to adapt the official list of SDG indicators in order to take account of the specific needs of local actors in the metropolitan region. In doing so, the PEMB followed its usual methodological premises: the project was collaborative, the group composition was based on the quadruple helix model, and the work had a concrete result with a useful purpose. The initial group agreed to review the 244 indicators of the global framework and choose only those that had an equivalent local indicator in available databases. The whole project was infused with practicality and realism. Making use of an online platform and holding five deliberative meetings, the group defined a smaller set of indicators oriented to local monitoring and reporting on the SDGs, as well as a larger set of mostly new indicators oriented to other monitoring needs on local sustainable development. This was the most practical solution to be able to dovetail local and global monitoring needs.

Introduction

This paper is based on the project’s final report, which documents the participatory process followed to create a set of local indicators for the Sustainable Development Goals (SDGs) put forward in the UN’s Agenda 2030. The purpose of a set of local indicators is to measure progress towards the SDGs by administrations, entities and companies in the local world in a standardized way.

The final report sets out the commissioned project, the process designed by the PEMB and any changes that were made over the course of the project, the final list of selected indicators, other reflections of interest, and recommendations that have arisen from collaboration with the working group.

Finally, we would like to emphasize the systemic lack of scientific data to design public policies at the local level, especially at the metropolitan scales. We found very few consolidated databases. This is a problem that will only be solved with the agreement and coordination of a territory’s main data producers (i.e., statistical institutes, research institutes, universities, computing centres, private companies and public administrations with their official registers and surveys).

Even though Agenda 2030 is a global inter-state agreement, it should be noted that the initiative for the PEMB project was mainly bottom-up, since it was driven by the local administration with collaboration from civil society organizations. We think that this is a clear example of how public policies and decision makers should cooperate in the future.

1. The final report is available on the PEMB website (in Catalan).
The Project

Since 2016, one of the PEMB’s basic principles of action has been to work toward the fulfilment of the SDGs and to collaborate in the implementation of Agenda 2030 in the Barcelona metropolitan region. Given that the PEMB is a non-governmental organization, however, it has also been necessary for the governmental context to begin developing its own localization processes.

With the creation of the High Commissioner for Agenda 2030 in May 2018, the reactivation of sustainable development issues at the Spanish state level encouraged the PEMB to continue work on local implementation of Agenda 2030. Closer to home, we also saw strong commitment to Agenda 2030 from the Generalitat de Catalunya (via its Advisory Council for Sustainable Development), from the Diputació de Barcelona (the provincial government) and from the Barcelona City Council, which has launched a variety of public programmes since 2016. In addition, the Barcelona Metropolitan Area (in Catalan, AMB) had embarked on its own immersion in the global agenda through its Metropolitan Action Plan 2019-2020. Therefore, the environment was clearly favourable for moving forward on Agenda 2030 and an issue as delicate as the evaluation of progress toward the SDGs.

The aim of the project was to identify a set of indicators that could be found in databases available online; that were equivalent to the indicators of the UN’s Agenda 2030 to carry out global monitoring of the SDGs, and that had local-scale data.

The purpose was to promote the implementation and monitoring of Agenda 2030 at the local level and most especially to enable local-scale organizations to carry out monitoring of the SDGs in their own territory in a standardized and comparable way.

The project had three operational objectives:

1. To obtain a group of indicators that could be used for the evaluation of the SDGs specifically at the local level by administrations, entities and companies.
2. To share knowledge about Agenda 2030, its implementation and evaluation (identifying common difficulties and sharing adopted solutions).
3. To create a collaborative working group on data and Agenda 2030 and facilitate networking among group members.

The Process

The organization of work

Given the collaborative nature of Agenda 2030 and the sheer volume of work to do (finding existing indicators that were equivalent to the 238 required by Agenda 2030), it was considered essential to design a collaborative work process. As a result, the work plan was organized as follows:

1. Creation of a group of collaborators, with knowledge on:
   - The subjects covered by the 17 SDGs
   - The existing and available databases in the territory, with data related to the local level.

   The group also needed to be made up of people from organizations that met a series of criteria (see subsection on the group’s profile). From the outset, the task was to set up a large working group, representing the diversity of agents that could use a set of local SDG indicators. The final group had 55 members.

2. Definition of the scope and type of work

   Scope: To identify indicators in our territory that were equivalent to the 244 general indicators on the official list of the UN’s Agenda 2030, prepared by the UN group of experts (December 2018 release).

   Type: For such a broad scope, the type of work had to be individual work by each of the collaborators to identify and propose the most appropriate equivalent indicators, as well as collaborative work with spaces for group deliberation to consider the selection of any indicators for which there was no agreement.

   In addition, we understood that work interactions could bring benefits to participants in terms of networking, new knowledge, deliberative experience, etc. As a result, we sought to organize meetings accordingly.

3. Design of the process

   Three subgroups were allocated the SDGs by subject matter, but with a balance in the number of indicators from the Agenda 2030 list that each had to work on.
The profile of the group

In relation to the composition of the group, we followed the usual criteria adopted in the PEMB’s collaborative projects:

- representativeness of the quadruple helix
- representativeness of different geographical scales, especially of the Barcelona Metropolitan Region (in Catalan, RMB)
- gender parity.

Despite seeking a balance of proportions through use of the quadruple helix, the 28 participants from the public administration (51%) stand out. This is because the interest in Agenda 2030 and the implementation of the SDGs among city councils prompted more of them to join during the project, increasing the proportion of public administrations. Likewise, it was more difficult for companies to participate, but those who did show interest were firmly committed to both attending and contributing.

Moreover, it was mentioned during the process that the participation of large data-producing institutions would have been very appropriate, because they could have provided a great deal of information about their own databases and others and they could have given input on the adequacy of certain indicators. In this regard, it should be mentioned that Idescat (the Statistical Institute of Catalonia) and Catalonia’s Advisory Council for Sustainable Development were invited to participate but could not do so due to a lack of available specialists at the time.

In relation to geographical scales present, most of the institutions operating in the territorial scope of the RMB are part of the PEMB’s network of collaborating entities, but there were also other local entities and entities of greater scope. It is important to highlight the role of entities of global and international relations throughout the process in sharing their knowledge of Agenda 2030 and contributing their interpretations of the various targets related to the 17 SDGs.

The phases of the process

The collaborative working process had three phases:

Phase 1. Common framework defined jointly with the group.

Phase 1 allowed us to put together the proposal for the work process, which included a collaborative part based on the group’s suggestions and agreements in the first meeting. The aspects decided jointly were the scope of the work (238 indicators, without any pre-selection) and the pace of the rounds and meetings (monthly), as well as the rest of the process that was designed by the PEMB team.

Phase 2. Proposal of indicators.

Phase 2 was organized into three rounds to distribute the work for each subgroup. Each round was limited in time and included:

- Individual work, using the online platform Loomio, where indicators available in the territory’s databases were proposed for possible inclusion in the set of local indicators. In each round, the subgroups worked on indicators corresponding to one or two SDGs.
- An in-person session, facilitated by the PEMB team, to engage in joint deliberation and collaborative selection of the most appropriate indicators from those proposed by individual members on the platform.
- Return of the work done, to provide additional comments and information. Participants also gave an evaluation of the work done by the PEMB office in order to make improvements in the remainder of the process.

Phase 3. Drafting of conclusions and open debates.

In addition to the work of finalizing a set of local indicators, the PEMB office wanted to have a closing session that included the following:

- Reflections and conclusions on the work sessions, the experience of the whole process, and any lessons for other work processes related to Agenda 2030.
Open discussions, to retrieve and reflect on aspects related to the global agenda that had been raised in work sessions and put on hold because they were not the focus of the work.

Both topics, despite moving away from the main task (the indicators), generated dialogue and allowed knowledge to be shared on actions around Agenda 2030, which is an important added value.

The facilitation methodology

Given the size of the working group (55 people) and the volume of work, the methodological approach drew on three tools that facilitated the work and allowed for the coordination of all participants. Basically, these tools were:

- An online platform for individual work by each participant on the proposal of indicators. The chosen platform was Loomio.
- Face-to-face sessions for joint discussion on the proposed indicators submitted by individual participants on the online work platform.
- Continuous evaluation of the process in order to adapt it to the needs expressed by participants and shared by the group.

Loomio platform

The Loomio platform was chosen on the basis of five prerequisites:

1. Must be an online workspace.
2. Must have a space to display the starting information easily and clearly.
   - This starting information was the description of the 238 “conceptual” indicators requested by Agenda 2030 to evaluate progress toward the SDGs in a territory, with their assignment to the corresponding target and goal.
   - We also wanted to include specific indicators chosen in other territories where their institutions had already done the work, and to provide the corresponding source (institution and database).
3. Must have a space to introduce the proposed indicators intended to cover the 238 indicators requested by Agenda 2030. In this sense, it was necessary to establish an information structure so that participants, for each indicator in the agenda, could introduce different proposals of equivalent indicators, with no limitation.
4. Must allow the proposed indicators to be easily commented on and evaluated with at least three different categories. In this way, the subsequent deliberation in the meetings could move forward more effectively.
5. Must have a low or no economic cost for the PEMB.

Based on the five prerequisites, we examined applications for discussion and online deliberation and selected two for comparison: Loomio and Decidim. Between the two, we chose Loomio because it required little configuration and permitted an immediate start. However, the performance and adequacy of the Decidim platform of the Barcelona City Council were fully confirmed and we look forward to using it in other PEMB projects.

With the Loomio platform, it was possible to introduce the information structure for all indicators (both the requested and proposed indicators). Loomio also met the other prerequisites with the sole exception that it did have a monthly cost of €24.50 (approximately €22) over the five months of its use in the project, from March to July 2019. The total amount was certainly acceptable to the PEMB.

Regarding platform configuration, we found a clear way to enter relevant information for the indicators requested by Agenda 2030 and for batteries from other scales (European, Spanish, other provinces, etc.), which helped in the task of identifying equivalent indicators, one by one. It also allowed for the introduction of valuable comments in the supplementary information. However, the available mechanism for introducing proposed indicators for possible inclusion was not as intuitive. At the proposal of the working group, we had to enter numbers to link each indicator requested by the UN with any equivalent proposal, since the relationship was not immediately apparent.

To facilitate the understanding and usability of the platform, the PEMB office developed a manual for using Loomio in the process. The manual is available for anyone who wants to consult it and evaluate the possibility of using Loomio in similar projects.

On the other hand, the platform evaluations made regularly by project participants revealed that the platform suffered from a certain lack of intuitive usability. It must be said that the platform had highly demanding requirements for the input and display of information, which proved to be a complicated and detailed task.
The facilitated working meetings

From the outset, we considered face-to-face meetings to be one of the basic elements of the process, essentially for two reasons:

• Firstly, to generate contacts and knowledge among the people in the working group, since they were all working on Agenda 2030 and the subjects covered by the SDGs, and face-to-face contact always encourages networking.

• Secondly, because the intention was for the work to be deliberative and collaborative, beyond the sum of individual contributions.

In this sense, the techniques of process facilitation, which the PEMB team has acquired through various training courses and previous experiences, were essential to guiding the work productively with due care for the time being set aside by participants.

Accordingly, each of the three phases had one facilitated face-to-face meeting. The design of each meeting included:

• An active welcome with some group dynamics to establish the current point in the process and, at the same time, to facilitate participant networking.

• Deliberation on each of the indicators proposed on the platform in the current phase of work. This task was carried out in subgroups, each of which was guided by a PEMB facilitator (who introduced the work for the session, addressed the needs of the subgroup and its members, made sure that the debate did not get stuck, and moderated turn-taking when necessary). The result of the deliberation was the selection of indicators to become part of the final set in accordance with the defined criteria and the agreement of the group.

• A brief closing plenary session, with a group dynamic related to Agenda 2030, to relax after the efforts of deliberation and give due attention to participants.

Evaluation of the process

The entire work process was evaluated using online questionnaires that were sent out on the same day as each face-to-face meeting. The questionnaires contained questions on various aspects of the project (clarity and adequacy of the project, platform tool and use, design and implementation of the process, the professionalism of the facilitators, the results that participants were achieving, the knowledge they were gaining, and overall satisfaction), as well as open questions to elicit suggestions for improvement.

The participants evaluated the various aspects of the process as follows:

Preparation and project

In the four sessions, over 90% stated that the goals were clear from the beginning. Also, more than 90% said that the methodology and approach were explained clearly (only 75% indicated so in the first session). Regarding support for the methodology, the percentage of participants who felt that it was the right one increased from 70% to 85% over the course of the four sessions. All agreed that the information had been provided with enough time for them to prepare for participation.

Online working platform

More than 85% thought that the information for working with the platform had been sent with enough lead time. As for the platform’s usability and ease of understanding, only 55% thought that it had been easy to understand and use at the end of the first phase. However, this figure rose to 80% with additional explanations and participants’ continued use. Of the group, 70% considered that it was useful to work on the platform, while the remaining 30% preferred only face-to-face work. In relation to the time allocated to working on the platform (15 days), 70% to 80% thought that it was enough, while the remaining participants did not agree very much.

Sessions

As for the running of the sessions, more than 90% of the participants said that the information had been sent well in advance, and between 85% and 100% (the figure rose as the sessions progressed) indicated that the purpose and objectives of the sessions had been clearly presented. Between 55% and 85% (with the figure trending upward) said that the dynamics chosen for the facilitated work were appropriate, and this figure reached 100% in the last session, which had different goals and dynamics.

The whole process was a challenge in terms of facilitation, due to the significant amount of work to be carried out, its “unpredetermined” nature and the number of participants involved. However, it was considered that defining a standard set of indicators to evaluate progress toward the SDGs at the local level should be a consensual task undertaken by a group that was representative of the diversity of agents that might use the local indicators. That is why this method of collaborative work was chosen.
In relation to the timetable and physical space of the meetings, the location had to be changed after the first meeting, and the location of the second meeting was suitable for more than 85% of participants. As for the professionalism of the facilitation team, specifically to encourage the performance of the planned work and to assist in the level of participation from group members, the evaluation showed that in the first session there was a low level of intervention by the facilitation team, which prevented the completion of the intended work in one of the subgroups. However, this recovered in subsequent sessions, in which participant satisfaction with the team and participation exceeded 90%.

**The Set of Indicators**

In relation to the indicators requested by Agenda 2030, the following table sets out the assigned work performed by each subgroup:

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The total of 398 proposed indicators put forward by the group can be broken down as follows:

- 329 proposals were equivalent to Agenda 2030 indicators
- 69 proposals were “extra” and deepened the evaluation of sustainable development in the metropolitan region (RMB)
- 291 proposals were accepted
- 45 proposals needed to be improved through research
- 62 proposals were discarded

336 indicators, 109 of which were selected for the common “reporting pack”

As a basis for the creation of an information system on the fulfillment of the SDGs in the territory, with the information broken down at different scales (local, metropolitan and regional).

The project represents a first step of the PEMB toward achievement of Agenda 2030, in terms of the collaborative work methodology and also the result, which is a set of local indicators identified for the SDGs. This is particularly important because the SDGs are one of the PEMB’s five principles of action, which guide our work on behalf of the local appropriation of Agenda 2030.

At the PEMB, we believe that it is not enough to make data available to the local world. The local world also needs to be involved and it needs to have specific incentives to take part in the evaluation of progress toward the SDGs, as well as support tools for collecting information and certain kinds of data from local councils. Also important in this effort is the creation of a community of users who can improve the set of indicators.

**Recommendations**

The selected set of indicators is available for use by any entity and may be used in a variety of ways. Examples include:

1. An initial diagnosis conducted by local entities to identify their degree of previous compliance with the SDGs and to help in setting priorities for projects and policies within their Municipal Action Plans (in Catalan, PAMs).
2. Monitoring the alignment of local entities with the SDGs, thus contributing to the regular follow-up that states must present before the UN Assembly.
Making Connections between the Institutional Quality Assessment and the Sustainable Development Goals: A Proposal of Quality Indicators for Sustainable Development in Higher Education

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Abstract
Higher education institutions all over the world have had a long history of making commitments to sustainability and have expressed their desire to align with the 2030 Agenda and its Sustainable Development Goals (SDGs). Few institutions, however, have adopted and advanced sustainable development as a whole-institution concern. This paper proposes that the quality assurance system and processes provide a good opportunity to embed the SDGs strategically and systemically.

The project “Making Connections between Institutional Evaluation and Sustainable Development Goals: Empowering Stakeholders for Quality Enhancement”, which was developed by the quality assurance agencies for higher education in Andorra (AQUA) and Aragón (ACQUA) with co-funding from the International Network for Quality Assurance Agencies in Higher Education (INQAAHE), has proposed a framework of indicators that emerged through a participatory process with the major internal and external stakeholders in Andorra and Aragón, guided and supervised by a board of experts in sustainability and quality in higher education.

This brief article outlines the project’s rationale and captures the process and learning attained over the life of the project. The indicators proposed by this report view sustainable development and the SDGs as relevant to all aspects of higher education. They seek a whole-institution approach to sustainable development, interpreting this agenda as relevant to leadership and management, teaching and learning, research and knowledge exchange, the staff and student experience, campus management, and partnerships and outreach. The project shows how quality frameworks and processes have the potential to promote and support both deep and wide approaches to sustainability in higher education.

Introduction
In the last five years, the higher education (HE) sector across the globe has committed to taking practical steps to advance the Sustainable Development Goals or SDGs (United Nations, 2015) (UN, 2019; SDIN Australia/Pacific, 2017; HESI, 2019). As HE institutions respond to the challenge, questions are being raised as to how we recognize, value and share experiences of quality in this field.
One of the purposes of the Bologna Declaration (1999) was to encourage quality assurance in HE by developing comparable criteria and methodologies, with the aim of enhancing the quality of study programmes, research and institutions. In this respect, quality assurance agencies act as a support for institutions in their continuing development and they play a key role as guardians of the public interest.

The SDGs provide a test ground for developing institutional indicators of quality and assessing institutional performance. HE institutions and quality assurance agencies are currently wrestling with how to tackle these cross-disciplinary issues in order to renew the education agenda.

The United Nations Economic Commission for Europe (UNECE) has a steering committee on Education for Sustainable Development (ESD) that has established priority actions in the area and agreed to create opportunities for international collaboration (UNECE, 2019). The UNECE steering committee seeks to inform policy, decisions and systems change in support of the 2030 Agenda, particularly in relation to quality education and standards in HE (Tilbury, 2019). It also sees the importance of working with education quality professionals, such as quality assessors, quality agencies, accreditation bodies and curriculum reviewers, who constitute a group that has yet to engage meaningfully with the SDGs. These stakeholders are rarely present in SDG policy dialogues, but they have significant responsibilities and are key agents in the system who have an ability to change education policy and practice nationally and internationally.

Also of interest to the current project is an initiative funded by the Higher Education Funding Council for England (HEFCE) with support from the UK’s Quality Assurance Agency (QAA). The UK initiative has led to the development of an “Online Guide to Quality and Education for Sustainability in Higher Education” (Tilbury & Ryan, 2015). The guide brings together lessons from five institutional pilot projects and a sector-wide view of how education for sustainable development (ESD) connects with quality assurance and enhancement in HE. It draws on the perspectives of key partner agencies in the project, such as QAA and the Higher Education Academy, as well as the project’s expert advisers and critical friends. The aim of creating this resource was to share practices and insights on how to bring ESD to life in systemic ways within loosely coupled, complex HE institutions, including consideration of some of the academic and leadership issues involved.1

The Context

The Andorran HE system has been part of the European Higher Education Area (EHEA) since 2003. It is a small and relatively recent system. These two characteristics permit all stakeholders to be very close and agile. The Quality Assurance Agency for Higher Education (AQUA) was created by law in 2016 with the aim of evaluating and accrediting official programmes and developing studies to enhance HE, following innovation trends in Europe.

In recent decades, the Andorran Government, most economic sectors of Andorra and Andorran society have committed to establishing action frameworks to achieve the SDGs at all levels. The HE sector is not secluded from this collective challenge.

AQUA’s governing body has formally committed to advancing sustainable development through its core agendas. In 2015, the governors committed AQUA to exploring innovative frameworks to assess quality and seek opportunities to embed the principles of sustainability at this level. In 2017, AQUA and the Complex Research Group (Universitat Autònoma de Barcelona) published a desk study entitled “Guidelines to Embed Sustainability in the HE Quality Assurance Framework” (Mülà, Junyent & Fonollida, 2017), which explores the possibility of connecting the SDGs with the standards and guidelines for quality assurance in the European Higher Education Area (EHEA). Following the conclusions of the desk study, the project “Making Connections” (Tilbury et al., 2019) was developed in 2018-2019 with co-funding from INQAAHE. The efforts of this project have led to the work presented in the current paper. In 2020, with co-funding from the Copernicus Alliance, AQUA has also developed the workshop “Quality and Sustainability in Higher Education: From Purpose to Practice”, which explores the possibility of embedding the SDGs into AQUA’s external evaluations. By taking these steps, AQUA has made headway toward a more applicable framework, which is currently a work in progress.

1. www.ethandipity.glos.ac.uk
The Project “Making Connections”

The project “Making Connections between Institutional Evaluation and Sustainable Development Goals (United Nations): Empowering Stakeholders for Quality Enhancement (S&Q&HE)” was developed by AQUA and ACPUA. It was one of the capacity-building projects which was awarded a grant from INQAAHE in 2018.

This initiative sought primarily to connect an institution’s quality assurance framework with the SDGs. The specific project objectives were:

1) To draw up a proposal of indicators to embed the SDGs into institutional quality evaluation

2) To empower internal and external stakeholders to enhance quality in Andorran and Aragonese HE institutions while taking into consideration the SDGs.

The project recognized the need for a participatory process to address issues regarding the assessment of quality in HE systems, particularly in relation to complex and evolving global challenges such as sustainable development. It asked questions about the institutional assessment of quality in HE and what form it might take.

For one year, both agencies worked with 37 internal and external stakeholders, who were key agents in HE and sustainability, with responsibility in policy and practice in the two territories. They included:

- representatives of students, graduates, professors and university governing bodies of all the universities in Aragón and Andorra
- potential employers
- members of the national and regional government in charge of HE and sustainability
- staff of both quality assurance agencies
- sustainability and education experts.

A board of experts guided the entire process throughout the project. The experts possess recognized experience in quality and sustainability in HE. Dr. Daniella Tilbury was the expert advisor and a member of the board, which also consisted of Dr. Pepe Gutiérrez, Dr. Mercè Junyent, Dr. Íngrid Mula and Dr. David Alba. The board advised that a project process underpinned by action learning would be valuable not only to the agencies but also to others who play a key role in advancing HE quality and sustainability.

To engage participants, collaborative activities were designed over one year:

- The 1st Forum of Quality and Sustainability (Andorra la Vella, October 2018) had the aim of starting the discussion, building a shared view of quality and sustainability and exploring alliances between the stakeholders.
- The 2nd Forum of Quality and Sustainability (Zaragoza, December 2018) analysed initiatives to introduce and evaluate the SDGs in the universities, and explored new challenges and commitments.
- Between the two forums, the participants worked autonomously in their institutions and each territory met to discuss current actions and potential initiatives.
- During these events, the board of experts collected data and in January 2019 was able to put forward a preliminary proposal of indicators. This proposal was discussed with the participants, and a final version was validated in March.

2. More information is available at www.aqua.ad

Figure 1. Project participants

The stakeholders engaged in the project were very diverse. This was intentional as the process sought to be inclusive and participatory.
The Indicators

Following the participatory, action learning process outlined above, a list of quality indicators was generated. The quality indicators are meant to identify the degree of embeddedness of the SDGs in an institution. They present the state of play or a snapshot of how an institution is performing across its different areas of responsibility regarding the SDGs.

Performance is usually ascertained based on an audit of policies, plans and activities. This can take the form of a questionnaire, focus group or series of interviews. Guidance notes are provided to assist with collecting data, making judgments against the indicators and generating an institutional score.

The indicator framework has been developed for use by institutions primarily for self-assessment purposes. The framework is also relevant to agencies that will need to validate and externally verify the performance as identified by the institutional review.

Nine different components underpin the indicator framework, which takes a whole-institution approach to the adoption of the SDGs in universities. A partial synthesis of the framework of indicators is presented in Figure 2, while the complete framework, which includes the assessment criteria and a scoring system with performance levels, is available online at www.aqua.ad (AQUA, 2019).

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<tr>
<td>1. Governance</td>
<td>1.1 The SDGs form part of the and Strategy institution’s governance framework and implementation is reported in a transparent manner.</td>
</tr>
<tr>
<td></td>
<td>1.2 The SDGs are included in university strategic documents as well as the university’s four-year planning cycle.</td>
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<tr>
<td></td>
<td>1.3 The implementation of the SDGs is monitored and evaluated in line with targets and outcomes identified in the strategic documents.</td>
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<tr>
<td></td>
<td>1.4 Leading practice in implementing the SDGs is recognized through internal and external awards.</td>
</tr>
<tr>
<td>2. Leadership</td>
<td>2.1 The institution makes an explicit and visible commitment to embracing the SDGs.</td>
</tr>
<tr>
<td></td>
<td>2.2 The institution works with other higher education institutions to improve the embedding of the SDGs in the quality frameworks and processes.</td>
</tr>
<tr>
<td></td>
<td>2.3 The institution reaches out to work with external partners to implement the SDGs through volunteering by staff and students and through other non-formal curriculum opportunities.</td>
</tr>
<tr>
<td>3. Quality Strategy and Process</td>
<td>3.1 The quality strategy or policy has the SDGs as a core commitment.</td>
</tr>
<tr>
<td></td>
<td>3.2 There is a strategy or policy that commits staff responsible for quality to professional development specifically on the SDGs.</td>
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<tr>
<td></td>
<td>3.3 The quality process assesses progress and makes a quality judgment on the degree of embeddedness of a whole-institution approach to the SDGs.</td>
</tr>
<tr>
<td>4. Training and Guidance</td>
<td>4.1 The institution has developed guidance documents and/or frameworks for developing good practice in relation to the SDGs.</td>
</tr>
<tr>
<td></td>
<td>4.2 Colleagues with responsibilities for quality at the institutional level have participated in a professional development offering or in a development and change programme related to the SDGs (expressed as %).</td>
</tr>
<tr>
<td></td>
<td>4.3 Colleagues who have a formal responsibility for teaching and learning have participated in a professional development offering or in a development and change programme related to the SDGs (expressed as %).</td>
</tr>
<tr>
<td></td>
<td>4.4 Colleagues who have responsibility for management and administration have participated in a professional development offering or in a development and change programme related to the SDGs (expressed as %).</td>
</tr>
<tr>
<td></td>
<td>4.5 Colleagues responsible for research and knowledge transfer activity have participated in a professional development offering or in a development and change programme related to the SDGs (expressed as %).</td>
</tr>
</tbody>
</table>
5. Resources and Funding

5.1 External and internal funding is found and allocated to SDG initiatives.

5.2 A team is established that is capable and qualified to plan, implement and evaluate SDG initiatives internally. The team is responsible for facilitating engagement and supporting stakeholders in this agenda.

6. Programmes

6.1 Degree programmes (UG and PG) provide opportunities to learn about the SDGs (expressed as %).

6.2 Degree programmes (UG and PG) have practical experience for students to learn how to address the SDGs in practice (work placements, community projects, campus projects, etc.) (expressed as %).

6.3 Programmes offer opportunities for students to understand the global significance and context of the SDGs (expressed as %).

6.4 Degree programmes (UG and PG) have explicit competences on sustainable development (expressed as %).

6.5 Programmes commit to learner-centred and active learning strategies associated with education for sustainable development (expressed as %).

6.6 Programmes have an assessed component in relation to learning and change for sustainable development (expressed as %).

7. Campus

7.1 There are volunteer opportunities for engagement in implementing the SDGs on campus (expressed as ratio of students).

7.2 There is a campus-wide quality system to progressively improve facilities performance considering the SDGs.

8. Students and Employment

8.1 There are feedback mechanisms where students (including employers) provide suggestions to improve the learning experience in relation to the SDGs.

8.2 Employers and student alumni provide feedback on the institution's contribution to the SDGs.

9. External Quality Assurance

9.1 The quality assurance agency, following a verification of evidence of the above, provides a positive report on the institution's performance in relation to the SDGs.

The intention is for this framework of indicators to foster learning and innovation rather than solely compliance. Those engaged in generating these indicators understand that change is not necessarily a linear process and that discussions and debates are required to embed the SDGs within quality frameworks and processes. There is also a recognition that the proposed indicator framework will need ongoing critique and evaluation as well as revision to remain relevant and ambitious.

In addition, it is recommended that the indicator framework is translated into the local language and that terminology is adapted to be relevant to national or regional circumstances. Equally, the framework would benefit from concrete local examples to illustrate what type of evidence or documentation is needed for the assessment criteria to be met. Stakeholder engagement has also highlighted that it is important for the quality assurance agencies to provide support alongside the framework in the form of guidance or training to assist with the transition towards institutional review processes in these countries that align with the proposed framework.
The Indicators

This ambitious project benefitted from a process that was exploratory and inclusive. Given the lack of tools to move forward with the implementation of this agenda, the initiative necessarily adopted an investigative and reflective process that assisted in identifying challenges early on, as well as strategies to overcome them.

The stakeholders who engaged in the project were diverse and able to bring a range of situations and circumstances to illustrate the institutional and professional needs that must be addressed by any indicator framework. This greatly assisted in the development process, as did the trusting and professional relationships between the agencies and the board.

The project process brought together two groups of HE professionals – quality specialists and sustainability experts – each rooted in different discourses and distinct ways of working. The project sought to create a crossroads to link their concerns, journeys and language. It created a permeable meeting space for the two groups to find overlapping interests, challenge each other’s worldviews and consider ways in which they could work together. The project also questioned the core purpose of HE, the institution and their professional roles in a social, and not solely academic, context.

Through the project, partnerships with the stakeholders were constructed in ways that challenged power hierarchies. This process aligned with the worldview that underpins sustainable development and that questions existing power relationships when promoting stakeholder participation in the development and implementation of initiatives.

The proposed indicators consider the SDGs as relevant to all aspects of HE. They seek a whole-institution approach to sustainable development, interpreting it as relevant to leadership and management, teaching and learning, research and knowledge exchange, the staff and student experience, campus management, and partnerships and outreach.

Finally, it is worth noting that quality assurance agencies, which formed an alliance for this project, belong to small HE systems in their respective territories. This has allowed closer collaboration between the agencies and their stakeholders, who are diverse but perhaps not too numerous.

The initiative has generated energy and tools to advance the adoption of the SDGs in HE in Andorra and Aragón. The project has also initiated a process of rethinking quality agendas and igniting a wider debate, of international significance, on how to assess and benchmark progress in this arena. It marks the beginning of a lengthy and challenging journey to redesign HE so that it realigns with the health and needs of people and of the planet.

References


PART VI - Social Impact through SDGs: Transforming Communities
The Implementation of Sustainable Development Goals in Teaching, Research and Organization at St. Pölten University of Applied Sciences
Raising Awareness and Increasing Sustainable Actions: Opportunities and Challenges

Silvia Udvary
University of Applied Sciences St. Pölten, Austria

Abstract
Universities play an important role in implementing the Sustainable Development Goals (SDGs) through their teaching, research, operations and leadership. The board of St. Pölten University of Applied Sciences (FHStP) decided to emphasize sustainable development two years after the Sustainable Development Goals (SDGs) were adopted. The following article describes the activities that have been carried out since then and the challenges, opportunities and difficulties faced at the FHStP.

Introduction: Sustainable Development as a Key Topic
The FHStP chose sustainable development as a key annual topic in 2018, following the previous year’s focus on ethics, since ethics is a cross-cutting aspect of sustainability and therefore remains a topic of discussion. As the plans related to sustainable development could not be fully implemented, the emphasis on this topic was extended into 2020. A strong impetus for choosing sustainable development came from the development and adoption of the SDGs by the United Nations and the general tendency to consider sustainability from a social, economic and ecological perspective. In addition, the Austrian sociopolitical discourse at the time influenced the board members, who decided to select an annual topic in addition to the tasks determined by the University of Applied Sciences Act (FHStG), to contribute to an educated society.

The following article outlines the activities that were designed to raise awareness at individual, organizational and societal levels. It starts with a short overview of the structure of the FHStP and its geographical situation and ends with a conclusion on opportunities and challenges.

Context and Initial Position
Measures
St. Pölten has three universities, approximately 55,000 inhabitants (Statistik Austria, 2019) and is around 60 km from Vienna. Vienna has almost two million inhabitants, so there are many commuters among students and employees in St. Pölten. The FHStP currently has over 3,200 students.

1. Fachhochschulstudiengesetz (Universities of Applied Sciences Act).
The aim since the introduction of the annual topic in sustainable development has been to raise awareness and reach individuals and key figures like teaching and scientific staff within the FHStP, as well as individuals and stakeholders in the region surrounding the university. The second year focused on continuing to raise awareness and increasing sustainable development actions. Some of the initiatives, activities and projects that have been undertaken are described below.

**Activities to Raise Awareness on Individual, Organizational and Societal Level**

**Environmental Analysis of FHStP related to Sustainable Development**

A first step was to analyse universities and UAS in Austria using international rankings like The Green Metric and to find partner universities that are active in the field of sustainability. As a result, best practices began to be exchanged with Nottingham Trent University and Hanze University of Applied Sciences, Groningen. The leading sustainable university in Austria (BOKU) was invited to present its sustainable strategy, sustainability mission statement and efforts to implement sustainability university-wide in the curricula.

**Sustainable Development Lounge – Public Film Events**

To reach an audience beyond staff, lecturers and students, with topics focused on the SDGs, the FHStP initiated a public film event and linked the subsequent discussions to the issues raised in the films. In cooperation with the local cinema, the film lounge started in May 2018. Invited guests were usually experts in the particular topic who were connected to the region or the UAS. The cooperation was a way to reach a different audience, use synergies, engage stakeholders and be present in the city centre of St. Pölten. To ensure the visibility of the SDGs, a poster showing them was put up at the entrance to the auditorium. The Head of the Academic Board, Monika Vyslouzil, opened each film night and introduced the evening’s topic. In addition, the cinema screen had a fixed-image with the general or specific SDG logos, depending on the film, to illustrate the interconnectedness of the goals. The chairing of the discussion was designed to incorporate

This section gives a brief overview of the FHStP’s structure, which shapes its activities and communication. It differs from other universities founded under the Universities of Applied Sciences (UAS) Act in that many of its decisions are made through agreement between the executive directors and the chairperson of the UAS Academic Board.

The FHStP is a limited liability company (GesmbH) which is an Austrian legal form for companies. This structure differs from that of other universities established with separate legislative acts. UAS have existed in Austria since the beginning of the 1990s. Since its foundation in 1996, the FHStP has continually increased the number of students and staff.

The following diagram shows the organizational structure and the communication flow chart, including direct and non-direct communication.

![Organisation Chart](image-url)

**Figure 1: Organizational Chart, FHStP, 2019**

It is difficult to implement authentic, credible sustainable development and to ensure communication between inhouse stakeholders. One challenge is indirect communication, due to the size of the institution and the structure established by a law that allows participative decision-making.

The FHStP’s strategic plans are drawn up for four years. The current period runs from the beginning of 2018 until the end of 2021. As the current strategic plan does not reflect sustainable development and the SDGs, the UAS Board at FHStP is addressing these issues in its annual topic.
sustainability questions and the SDGs. By January 2020, the Sustainable Development Lounge had been held seven times: six times at the local Cinema Paradiso St. Pölten and once at the FHStP.

1. The Green Lie by Werner Boote (May 2018)
This film addresses several SDGs. The discussion was mainly on SDG 12 and the notion of sustainability. The director Werner Boote is Austrian and a lecturer at the FHStP.

2. Eldorado by Markus Imhof (June 2018)
A high-profile discussion with scholars, volunteers, professionals and affected refugees took place after this documentary. There is no separate SDG for migration. However, the International Organization of Migration analysed how migration is reflected in Agenda 2030 and published its conclusions on its website https://unofficieny.iom.int/2030-agenda-sustainable-development (IOM, 2016).

3. Guardians of the Earth by Filip Antoni Malinowski (November 2018)
The documentary shows the difficult, challenging and successful discussions of the IPCC4 that led to the Paris Agreement in 2015.

Consumption habits, travel and the need for transformation as well as climate issues were addressed in this movie. The post-screening discussion included the principal actor and the director.

5. Essen im Eimer (short version of Taste the Waste) by Felicitas Schneider (September 2019).
Students from the Dietetics Department launched a community refrigerator called FairTeiler, which is part of a non-profit organization in St. Pölten that started out in Germany. The student union supported and bought the refrigerator. At the official kick-off, the UAS board organized the showing of a short version of the documentary Taste the Waste. The subsequent discussion was chaired by the student’s union and included two members of a food-sharing organization and the manager of the university’s dining hall.

This Austrian documentary about sustainable consumption and production habits was also promoted within the film series.

7. Couch Connections by Christoph Pehofer (January 2019)
One of the most inspiring movies presented within the Sustainable Development Lounge was by an alumnus of the FHStP. The documentary about the community of couch surfers was not intentionally made to address sustainability issues but includes many aspects of the SDGs and therefore fit very well in the film series.

Public, Interdisciplinary Lectures Available Online5
A public lecture series was held, alongside the film series, as another step to increase awareness among students, staff and locals. A recorded version of the lecture series is available online. The eight lectures covered a broad view of sustainable development including local issues and study fields within the FHStP. Four of the nine lectures were given in English:

1. Understanding Sustainability: the Role of the UN Environmental Programme and SDGs
2. Gender Equality, Empowerment, Gleichstellung: SDG5
3. Carbon Footprinting for Beginners
5. Lokale Erneuerbare Energien
6. Sustainability on Railways
7. The role of IT in the Implementation of the SDGs
8. Sustainability in St. Pölten
9. Nachhaltige Entwicklung als Kommunikationsaufgabe

Marketing and Communication of FHStP Topics
During 2018, a change of mindset could be seen within the FHStP. Social media reflected an increasing interest in sustainable development issues and habits were evaluated. The marketing and communication department

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4 Intergovernmental Panel on Climate Change
5 https://kollegium-f.fhstp.ac.at/ringvorlesung-ws18-19/
published its quarterly magazine in June 2019 with the title Sustainable Development and hosted the corresponding release wissen.vorsprung on this topic. This event, which was held in Vienna, was one of the best-attended in the series, with approximately 90 visitors.

Temporary Sustainable Development Committee

In 2019, the focus shifted towards organizational and further structural levels. A temporary committee established in April 2019 advocated for sustainable development within the university by identifying and communicating with relevant stakeholders, including the student’s union. One aim was to prepare a mission statement and sustainable development input for the next strategy of the University of Applied Sciences. In a participatory process, the committee determined which SDGs the university should focus on. These turned out to be SDGs 4, 11, 12, 13 and 15. Subgroups work on climate action topics like mobility, food and electricity. The most challenging task seems to be the transition from awareness-building to action, which involves increased personal and financial resources.

Welcome Receptions of the UAS Board, 2018 and 2019

The first welcome reception of the chairperson of the UAS Board addressed Sustainable Development in Higher Education with short panel sessions by Austrian experts. The event encouraged discussion of the topic among teaching and research staff and study programme managers.

After the Sustainable Development Committee had been established, organizational topics increased and intertwined with scientific and teaching approaches. The next welcome reception focused on Universities in Transition, Sustainability in Teaching, Research and Organization. Again, the focus was on discussing and exchanging ideas, thoughts, activities and needs and then determining how to start incorporating sustainable development on all levels.

Higher Education Curricula Guidelines

The Higher Education Development Department revised curricula guidelines and added the five selected core SDGs discussed by the Sustainable Development Committee. The curricula are revised every five years and the aim is to ensure that sustainable development and relevant SDGs are implemented during this period.

Communication through Social, Print Media and Events

The above activities were strongly promoted on social media and local print media. A microsite for the annual topic in sustainable development was created to support communication. In addition, Facebook events were created (2018).

Many science and administration departments promoted the topic through their own social media sites. All events, committees, welcome receptions, meetings and personal exchanges were designed to support communication and action towards a sustainable transition.

The efforts were also reflected through acknowledgment in the publication Bildung für nachhaltige Entwicklung – Best of Austria (BMNT, 2018, p. 44), acceptance as a member of SDG Watch Austria (SDG Watch, 2019) and an invitation to a panel discussion at the 2nd International Conference on SDGs: Higher Education & Science Take Action (GUNI, 2020).

The initiatives described in the above section are forms of communication, which include discussion and reflection on processes. Along with raising awareness, these necessary actions start a transformation process, which includes sustainable development on all levels.

Opportunities and Challenges

Location

Many students and employees commute to St. Pölten. Events sometimes seem to compete for audiences with many activities in St. Pölten and the nearby city of Vienna.

The Curriculum at a University of Applied Sciences

The University of Applied Sciences does not provide much space within study programmes for optional lectures. If the course curriculum does not require attendance at an event, it is not guaranteed that students will take the time to go, especially if it offers little or no credit towards their degree.

Future opportunities lie in revising the guidelines by engaging study programme managers, curriculum development teams and the higher education development team.
Target Audiences
The lecture and film series targeted a wide audience with little knowledge of sustainability. Even though the series was accompanied by a large social media campaign (several newsletters were published in the sustainability and local community, the education sector and in-house media channels), more guests could have been accommodated in the available space.

The discussions at the post-event receptions were widely perceived as positive.

The temporary Sustainable Development Committee has a high level of staff participation with many changes in membership.

The FHStP is not known as a green University of Applied Sciences, but neither does it have a reputation as being oblivious to the SDGs. It has genuinely green and/or social projects in the health sector as well as projects that take an interdisciplinary approach. This provides the opportunity to emphasise achievements and continue acting with an awareness of sustainability.

Communication
One main difficulty is creating within and outside the University of Applied Sciences effective marketing and public relations in print and social media to increase the number of guests at events and awareness. More personnel resources are needed for marketing.

The Notion of Sustainability

Communication through Social, Print Media and Events
Many people in Austria seem to be tired of the notion of sustainability. The notion of sustainable development stresses the nature of a process, which can go in two directions. This slight change in notion seems to reach people more effectively.

The Value of Sustainability and Sustainable Development

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The Measurement of Success
Whether an audience has been reached can be measured by the number of guests participating at an event. Clicks on social media for the film and lecture series were impressive and went into the thousands. However, rarely more than 25 guests attended the lectures. This is in contrast to the film series, where screenings sometimes sold out.

One difficulty is how to measure acknowledgement, awareness and transformation. This long-term process requires a long-term focus and high tolerance of frustration. Again, working in this field requires tenacity.

Future Prospects
In March 2020, thematic SDG weeks were launched in teaching that address SDG 5. Further thematic weeks are planned.

On 4 June 2020, the first Sustainability Day will be held at the FHStP. This will be a chance to reflect on the work carried out within the annual topic. It will provide visibility to all stakeholders within the university, close to the university and within the region. At this event, for the first time the FHStP will award five sustainability prizes in several categories, sponsored by the Förderverein (Booster Club) for students.

Conclusions
It is challenging to communicate: to convey the intended message to audiences through events and activities. Many ideas have been developed and implemented since the first year of promoting sustainable development at the FHStP. This survey of the past two years clearly reveals the efforts made to raise awareness and promote the transition to sustainable practices. However, this article is not possible to please everyone. Actions with the greatest outcome need to be continuously evaluated and selected based on personal, financial and organizational resources. These actions are often not the ones that are immediately successful. Some topics may have a high emotional value, but are not the solution for reducing greenhouse gases. Therefore, working in this field requires tenacity.
does not consider the pace of implementation. Whether the selected actions will be successful remains to be seen over the next few years. To promote sustainable development, a combination of scientific, marketing, communication, structure, values and normative knowledge is necessary to break cognitive silos and engage stakeholders. Successful implementation inevitably requires financial and personnel resources.

References


Weaving Communities, the Missing Link for the Social Impact of Universities: Using Network Analysis to Study the Formation of Communities at the UPC

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Universitat Politècnica de Catalunya-BarcelonaTech, Spain

Abstract
Collaboration between and among organizations is one of the key elements of their sustainability and resiliency (Capra, 2002). One of the most effective ways to enhance collaboration, especially in the areas that concern social impact, social responsibility and the promotion of the SDGs, is through the fostering of collaborative communities with a shared purpose. The ultimate aim of this research is to explore whether it is possible to generate such communities, make them sustainable and develop metrics to measure their practices.

This paper presents two cases of community creation within the Universitat Politècnica de Catalunya – BarcelonaTech (UPC): the first case focuses on improving university management, while the second one focuses on development cooperation activities. The description of both cases shows how the sustainability and effectiveness of these communities can be studied through the lens of network analysis and complexity.

The first case concerns the UPC’s Nexus24 initiative, which is an internal programme launched in 2014. With this programme, the UPC’s aim is to “mak[e] collaborative work normal by 2024” by overcoming organizational fragmentation, enhancing collaborative communities across the UPC and making the UPC more adaptive, flexible and innovative. The potential is to change not only the culture but also the operating system through the creation of a working structure that is complementary to the formal one and achieves the status of a community (Nexus24 activities will be referred to as N24A).

The second case relates to one of the main activities of the UPC’s Centre for Development Cooperation (CCD). For 28 years the UPC, through the CCD, has promoted roughly 60-70 cooperation projects (CPs) per year, drawing on the involvement of thousands of people, including staff, teachers and students.

The traditional approach to the social commitment of universities has not paid enough attention to the quality and quantity of relationships. Can tools based on complex networks identify the necessary levers to upgrade such networks so that they become communities with a shared purpose?

Introduction
Collaboration between and among organizations is one of the key elements of their sustainability and resiliency (Capra, 2002). One of the most effective ways to enhance collaboration, especially in the areas that concern social impact, social responsibility and the promotion of the SDGs, is to foster the emergence of collaborative communities that have a shared purpose. Achieving the SDGs requires collaboration on multiple levels, for example, among actors, stakeholders and institutions, while another characteristic of the SDGs’ challenge for society is that they are transdisciplinary.

A community, in this paper, is seen as a group of people who share a purpose in common. A community can be defined by the shared attributes of the people in it and/or by the strength of the connections among them. Their members are allies in some way and feel some sense of belonging or interpersonal connection. In more mathematical terms, the
parameters which we study are the “degree” and the “clustering coefficient” of such a network.

This paper is part of an action research project that applies concepts and methodologies from the theories of network analysis and complexity to the UPC’s Nexus24 Programme. With this programme, the UPC aims to “make collaborative work normal by 2024” by overcoming organizational fragmentation, enhancing collaborative communities across the UPC and making the UPC more adaptive, flexible and innovative. This network-type structure would be organic, based on self-managed teams, and it would produce value through innovative projects. The potential is to change not only the culture but also the operating system through the creation of a working structure that is complementary to the formal one.

In this paper, we take the methodologies used by Ferrer-Balas et al. (2019) and apply them to one of the core activities of the UPC’s Centre for Development Cooperation (CCD). Since 1992, the CCD has coordinated the UPC’s development cooperation and volunteer programmes, and it is the office responsible for achieving the UPC’s aim to “train engineers and scientists that become engaged and active professionals, and can contribute in building a more fair and sustainable world” (Universitat Politècnica de Catalunya BarcelonaTech, 2020a). During this time, the CCD has promoted around 60-70 cooperation projects (CPs) per year, drawing on the participation of thousands of people, including staff, teachers and students.

While the CCD’s objective is not directly related to community management, the CPs have a clear impact on the achievement of the SDGs in the university. This is why we want to explore the potential of CPs to build community by comparing their dynamics to the dynamics of the Nexus24 Programme, which does have a key objective to create collaborative communities, and by understanding which practices are transferable from one case to the other.

Materials and Methods

The two cases in this study both relate to parts of the UPC. The UPC is made up of six different campuses distributed across Barcelona. The total number of people who can participate in the two initiatives includes 27,424 students, 2,778 teaching and research staff (PDI) and 1,492 administrative and service staff (PAS) (Universitat Politècnica de Catalunya BarcelonaTech, 2020b). While the Nexus24 Programme focuses primarily on administrative and service staff, the CPs are community-wide and involve mainly students and teaching and research staff.

In this analysis we use data from the CPs and the Nexus24 Programme activities (N24A). The data to build the CP networks come from the CCD’s records of participation (for comparison reasons, only the internal actors are taken into account, though several external actors may be involved in any given CP). Also, for the CPs, we analyze the years from 2012 to 2018. Over this timeframe, there has been one project call per year to select and approve cooperation projects, and there have been 387 projects in total, involving 929 participants. The N24A data come from participant registrations in Nexus24 activities as described in another recent paper (Ferrer-Balas et al., 2019).

Our raw data contain complete information on the projects and the participants. However, for the scope of this analysis, we use only the information set out in Table 1.

<table>
<thead>
<tr>
<th>Projects</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project code</td>
<td>Type of participant</td>
</tr>
<tr>
<td>- Professor</td>
<td>- Student</td>
</tr>
</tbody>
</table>

Table 1: Information used in the analysis.

For our main network analysis tools, we use RStudio (RStudio Team, 2015) with the igraph package (Csardi & Nepusz, 2006) and NodeXL (Smith et al., 2010), an add-on for Microsoft Excel. To make an accurate comparison of the two networks, the methodology follows the one presented by Ferrer-Balas et al. (2019).

Centrality Measures and Network Analysis

A network is composed of nodes and links. In the case of CPs, there are two types of nodes: the first type represents projects, while the second type represents the participants in each project. A link exists between a project node and a participant node if the person has participated in the project. A network of this kind, with two different types of nodes, is called bipartite. A bipartite network can be transformed into two projections that generate a one-type network. A projection onto the participants generates a network containing only the participant nodes. In this projection, two participants will be connected by a link if both of them have participated in the same project.
We built both the year-by-year network and the cumulative network for all periods taken into consideration. We then used the characteristics of the networks to compare them with the N24A networks.

We carried out a descriptive analysis of the networks, using centrality measures applied to the giant component of the network. In particular, we used the centrality measures of degree and clustering coefficient (Newman, 2010) to assess the evolution of the network:

- **Degree**. The degree \( k_i \) of a node is the most commonly used measure of centrality; it is defined as the number of edges connected to the node, in terms of the following adjacency matrix:

\[
    k_i = \sum_{j=1}^{n} A_{ij}
\]

- **Clustering coefficient**. The clustering coefficient \( C_i \) of the node \( i \) quantifies the cliquishness of a node, that is, the level of local connectivity of the first neighbours of that node; it is defined as the number of closed triangles over the total number of connected triplets of that node:

\[
    C_i = \frac{\text{Number of closed triangles}}{\text{Total number of triplets of nodes}} \cdot 3
\]

**Results and Discussion**

In Figure 1A above, we can see the evolution of the CP bipartite network year by year. Firstly, we can observe how the general structure of the network does not differ substantially from one year to the next. The network is disconnected, we can find some clusters of projects, but they are generally isolated from one another. If we turn to Figure 1B and the cumulative network, we can see how the connectivity of the network increases, and how in 2017 and 2018 there is a big cluster of projects. However, many projects and participants remain isolated both from this central cluster and from other projects.

This structure is not a surprise, because the support given to the CPs comes in the form of resources over the years taken into consideration, but does not involve the active promotion of collaboration between participants in different projects. As a result, we turned to the participant projections of the bipartite networks to better understand how the community has evolved.

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**Figure 2** Cumulative participant network of CPs. Nodes are participants and there is a link between two nodes if they participate in the same project.

In Figure 2 above, we can observe how participant networks evolve in the period under analysis. If we compare this evolution to the Nexus24 Programme in Figure 3 below, we can observe major differences in:

- Growth of edges and nodes
- Giant component and number of connected components.

1. The cumulative network, as its name suggests, accumulates nodes and links at every time step, summing up data from year to year.
In the CP cumulative participant network, the number of nodes grew with a comparable increase in the number of edges (see Figure 4 below). This is a big difference from the Nexus24 network, where the growth rate of the edges went from 10 to 50 times greater than the growth rate of the nodes over the period considered (see Figure 5 below).

Following this rationale, we filtered the CP cumulative participant network by excluding students to obtain a network of participants containing only PDI and PAS (see Figure 7 below). These participants are more stable than the students, and we would expect that they represent the backbone of the community. We observe as...
expected, that the number of nodes decreases, but more interestingly the connectivity of the network also decreases.

The pattern described for the complete participant network is similar to the one with only PDI and PAS:

• The numbers of edges and nodes grow at comparable rates (see Figure 8 and Figure 9 below)
• The number of connected components increases over time (see Figure 10 below).

What is more surprising is that the number of single vertex components (nodes without connections) increases as well (see Figure 10 below). We can interpret that when a PDI or PAS decides to participate in the CP call, it is not to seek formal collaboration – by formal collaboration, we mean the collaboration reflected in our data – in any existing collaborative group. Rather, almost 50% of PDI and PAS (the minimum is 30% and the maximum is 46% depending on the year) submit applications to the call independently with no connections to other projects.
Conclusions

When comparing the N24A and CP cases, we have to take into account the structural difference between the annual call for cooperation projects (CPs) and the Nexus24 Programme activities:

- The CP network is based only on data reflecting participation in the selected cooperation projects, which constitute the main objective of the programme. However, there are no data on the collateral activities that enable or support the projects, nor on any external actors, and this could change the visual representation of the resulting network.
- The Nexus24 Programme has an explicit aim to increase the connectivity of PAS by training people and bringing them together in a community. As a result, it records data not only about projects but also about activities aimed at connecting people.

We can see how the main changes in N24A networks arise when actions other than projects are taken to foster and facilitate the Nexus24 community. On the other hand, the CP network presents a more stable structure over time. When evaluating the networks as representations of a community, the structure of the CP networks suggests that the CP community is segmented, and the focused examination of PDI and PAS networks confirms this hypothesis.

From a comparison of the Nexus24 Programme network based on previous work by Ferrer-Balas et al. (2019) and the CP network, it is possible to identify actions taken in the Nexus24 Programme that have changed the growth of its network into a structure that we consider representative of a collaborative community. In particular, we find:

- The diversification of activities: the connectivity of the network increases when there is an opportunity to participate in additional activities. Also, from looking at the growth of links that generally occurs after any initial participation, there is secondary involvement in other Nexus24 activities.
- The network needs care: if the objective is to create strong relationships that last over time, it is important to make efforts that are aimed at fostering the network. In the case of N24A, these efforts include explicit facilitation and support processes and services carried out by trained people to help the community through training and advice on working collaboratively.

One of the strengths of the CP network is its ability to include all university groups - students, PDI and PAS - and to create and spread knowledge and values within all these groups and in the communities in which the projects have an impact. On the other hand, the Nexus24 Programme builds skills and knowledge in collaborative work but its focus has been narrowed to the PAS community. Given that these skills are critical to addressing the challenges posed by the SDGs, the question is this: How could Nexus24 help to reach the other university groups in order to spread its knowledge and tools?

To conclude, this study has shown that the methods used to compare the two cases, blending complex network analysis with qualitative information, are helpful to understand the dynamics of communities and to highlight opportunities for those who are responsible for community engagement and the university’s contribution to the SDGs.

References

Fontys and SDGs on Stage: a Content and Internship Platform for SDGs and Higher Education

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Abstract
In the Netherlands, the SDG Charter was founded in 2014 with the mission to "connect for impact": to bring together actors, catalyse joint actions and create synergy to work towards the SDGs. Fontys signed this Charter two years ago together with seven other Universities of Applied Sciences (UAS). This was the start of an SDG coalition consisting of UAS in the Netherlands. Together we try to work on ways to integrate SDGs into our curricula and educate SDG-competent students. On 9 May 2019, the coalition managed to get all 36 UAS in the Netherlands to sign the Charter and commit to the SDGs. The same day, we launched SDGs on Stage: a Content and Internship Platform for SDGs and Higher Education. UAS in the Netherlands are famous for their practical approach. The motto "from talking to doing" is used frequently. The idea for building the platform is associated with the fact that students learn best in co-creation with other stakeholders and not just within university walls. At the same time, businesses (especially SMEs) tend to lack time and resources to work on making their business models sustainable. Good content is crucial in this matter. People seem to understand the bigger picture but are missing impactful stories that show them how others work on the SDGs and why this is the way forward for them as well, to grow as a business. Therefore, we created SDGs on Stage with three other UAS and a company that tells the story of Sustainable Entrepreneurs. In this collaboration, the SDG Charter and other leading network organizations in the area of SDGs play a role.

Contribution
In the Netherlands, the SDG Charter was founded in 2014 with the mission to "connect for impact": to bring together actors, catalyse joint actions and create synergies to work towards the SDGs. Fontys signed this Charter two years ago with seven other Universities of Applied Sciences (UAS). This was the start of an SDG Coalition consisting of UAS in the Netherlands. Together, we try to work on ways to integrate SDGs into our curricula and educate SDG-competent students.

UAS in the Netherlands are famous for their practical approach. The motto "from talking to doing" is used frequently. So when Fontys signed the SDG Charter we felt we also needed to do something. The first step was to set-up a meeting between our (former) president of the Board of Directors and the Director of the SDG Charter. At Fontys we educate our students with the mission to provide them with the right skills to find a meaningful place in society. This system is called Technology, Entrepreneurship and Creativity (TEC) for Society. We believe that these are the basic skills every student needs. Students should learn how to use technology to reach certain goals, to have an entrepreneurial mindset and to be creative in the generation of new and innovative ideas and in the formation of the right teams to achieve the goals. The conclusion of the meeting was that students learn best in co-creation with other stakeholders and not just within university walls. Therefore, we needed to create a platform that would connect students, organizations and teachers. We also wanted to make sure that all the UAS were involved in the SDG Coalition so that we could start collaborating to train almost half a million SDG-competent students, as UAS host about 450,000 students per year.
The first step was to find partners with whom to build this platform. After some meetings and calls we found four. DuurzaamBedrijfsleven, which is the company that tells the Sustainable Entrepreneurs story and three other UAS (Avans, Saxion and Hanzehogeschool). We all invested an equal amount of money and had two months to build the platform. We knew that besides helping our students to put their skills into practice, businesses (especially SMEs) tend to lack time and resources to work on making their business models more sustainable. At the same time, if we wanted to attract target groups to the platform and make sure they would be inspired, we needed to create good content. Therefore, the key was to create a platform where students and companies could find each other and where we would create content that shows the impact of SDG-related internships.

This was difficult to achieve in so little time, but we managed to launch www.sdgsonstage.nl on 9 May 2019. On the same day, we announced that all 36 UAS in the Netherlands had signed the SDG Charter. We had created the biggest collaboration in the Netherlands on SDGs and higher education. The SDG Charter and other leading network organizations in the area of SDGs play a role in this collaboration. After this euphoric day, we realized that we had established the bases, but a lot more work needed to be done. A platform like this does not attract students and companies by itself. The website was up and running, but it needed continuous content and more features to improve quality. In addition, a governance structure was required to manage the project. We had omitted some steps in the process so that we could work fast and create something with potential. Now it was time to organise everything and look to the future. We needed to make a long-term plan and find more partners to pay the bills. This was the most difficult part of the entire process. The number of new partners did not increase as fast as we had hoped, so we needed to obtain balance in our ambitions and budget. At the same time, the steering group of presidents of the boards of directors and the CEO of DuurzaamBedrijfsleven had not met face to face, except on the platform launch day. Therefore, putting a structure in place to govern the project was a major priority. The project team did not have clear division of tasks and we started to note the lack of an officially assigned project leader. We also needed to find a group of students who would work on the platform (communication, data analysis and content creation) as interns. The platform was created with the idea that it was for and by students. However, timing is very important and the structure of curricula did not always match the platform’s need for good interns. For about ten months we looked for the best way to proceed and form a strong team and a governance structure and to get all founding partners to commit to a long-term plan.

In the meantime, the results were reasonable. Student numbers on the platform grew slowly and the number of internships that were offered also increased gradually. Interestingly, Fontys managed to encourage one of the regions where we are located to sign the SDG Charter. A region signing the Charter was something new, but a few weeks after the launch of the platform Brainport Development also signed with 160+ companies during an event that was organized at Fontys. We presented SDGs on Stage as one of the ways for these companies to really start working on reaching the SDGs. The result was a boost in new internship offers from our regional businesses. We also managed to find five new partner UAS and one student completed an internship and created some good content. The reactions of businesses to the platform were very promising and people even picked up on the idea internationally. Research universities and vocational training centres expressed their wish to access the platform and the need for an English translation of content for international students was expressed. Therefore, with little investment, we managed to grow and attract attention. We were careful not to promote SDGs on Stage too much to companies, as we wanted to have everything in order first and make sure we could promote the initiative properly amongst our students. These results made us even more determined that this could be successful in the long run and with the right amount of investment.

Even in the midst of the Coronavirus crisis, we have not stopped. The steering group and project team had a meeting in the third week of April to discuss the new plan that was created for the coming years. They decided to make an additional investment and DuurzaamBedrijfsleven will take the role of project leader.
next year. A more detailed plan of action is being
developed, and the steering group is meeting every few
months to carry out this work and ensure that we are on
track. The project team will have clear tasks and time to
execute them.

Some important lessons learned to date include:

- Finding strong partners with the same goals and keeping
  them involved as much as possible is crucial, especially
  at the level of the steering group, as they are the decision
  takers and need to be up-to-date all the time.

- Involving an organization as an equal partner that can
  work fast and has a big network will help to move the
  project ahead faster than if it is just left with university
  partners.

- Working with an organization as an equal partner is not
  beneficial to this project but it is also unique. Open
  communication and clarity about everybody’s goals are
  required to make it work.

- A clear governance structure is crucial to the success of
  a project.

- Communication is very important and versatile, so a
  communication plan is crucial for internal and external
  reach.

- Creating a strong project team with people who
  understand and believe in the project and have the time
  and mandate to work on it is a basic need for success.

- In order to create something innovative like SDGs on
  Stage you might need to work fast to create momentum
  at the right time. This also means that the order of things
  might not be ideal and could mean extra work afterwards
  to get everybody on the same page.

- It is really important to start small and focus on the basics
  before working on extras and involving third parties who
  are not needed initially. Involving other people too soon
  will only bring up questions that you cannot yet answer
  and raise high expectations, which need time and
  development to be fulfilled.

In these uncertain times, it is even clearer that future proof
of internships is crucial. Companies will have to
adapt to the new normal and find ways to survive, and
at the same time new types of businesses will have to
emerge. Students need to develop their future skills to
be able to solve societal problems and make sure they
play a meaningful role in society, as student, entrepreneur
or employee. It is essential to build a bridge between
students and organizations and use the impact of this
contact as inspiration and hope for others.
Universities’ Social Responsibility and the Sustainable Development Goals:  
A Paraguayan Experience

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Abstract
The adoption of the Sustainable Development Goals (SDGs) and the demanding Agenda 2030 established a real commitment in governments and societies all over the world to achieve the SDGs. Universities, as key actors in society, must also give due regard to the SDGs. This paper looks first at the social commitment of universities. Then it examines how the commitment to achieve the SDGs has been pursued at the Iberoamerican University of Paraguay, particularly through the recent development of specific projects. Finally, some recommendations are put forward. Throughout, the paper seeks to show how the social responsibility programmes of universities provide good frameworks for efforts to achieve the SDGs.

Introduction
In 2015, the adoption of the Sustainable Development Goals (SDGs) and the demanding Agenda 2030 established a commitment among states and international organizations that forced governments and societies worldwide to take new steps requiring holistic planning and a cross-cutting approach to accomplish the 17 goals proposed by the Agenda.

Didriksson (2019) acknowledges that the accomplishment of these goals will require “concerted actions by states and main drivers of change, such as universities, to achieve new kinds of development” (p. 35). This idea of integrated solutions is also reinforced in The Sustainable Development Goals Report 2019 published by the United Nations at the end of 2019.

Moreover, universities are key actors in the process and should play a prominent role in the implementation of Agenda 2030. This calls for innovation and transformation in universities themselves in a context in which it is no longer possible to think of maintaining a “static and traditional university model” rather than a “dynamic model” that features a strong link to the community to which a university belongs. Universities must be aware of what the community needs and also what the society overall expects of them.

In Latin America in particular, the role of higher education institutions has had an impact on efforts to achieve the SDGs. In 2018, the Third Regional Conference in Higher Education (CRES in its Spanish acronym) took place in Cordoba, Argentina, drawing nearly 12,000 attendees including authorities, rectors, deans, professors, graduates and non-graduate students from all over the region. The conference agreed a Declaration of Principles and an Action Plan 2018-2028. Both documents clearly recognize the commitment of higher education institutions to the SDGs for the Latin American and Caribbean regions.

Another point for consideration is the socioeconomic situation of the continent. According to the United Nations Economic Commission for Latin America and the Caribbean (ECLAC), poverty levels have been rising in recent years:
“[F]rom 2015 onward the levels of poverty and especially extreme poverty increased. In 2018, about 30.1% of the regional population was below the poverty line, while 10.7% was below the extreme poverty line. This meant that about 185 million people were living in poverty, 66 million of them in extreme poverty”

(ECLAC, 2019, p. 17).

In this context, Latin America requires universities to be prominent actors in integrated efforts to achieve real change. As Jimenez (2007) noted, “the situation in Latin America has prompted universities to consider social commitment or, in other words, social responsibility to be an essential principle driving their actions”.

Paraguay as a Latin American country is no exception in the region. Even though the country has succeeded in decreasing the level of poverty, both corruption and social inequality remain important issues to resolve. Strategic alliances between key actors in society are needed to confront these problems. Once again, universities have an important role at this stage. In fact, Bokhari (2017) remarks that “global experience has indicated that the role of universities in [sustainable development] is influential, particularly through the performance of University Social Responsibility” (p. 6).

At this point, the following questions can be formulated: Have Latin American universities assumed their social responsibility? Are Latin American universities taking action to implement Agenda 2030? At present, it is possible to find many positive experiences of higher education institutions in Latin America that are working with social responsibility programmes and linking them to the SDGs. This paper will look first at how the Iberoamerican University of Paraguay has implemented a social responsibility programme focused on the Sustainable Development Goals. Then it will examine a specific project. Finally, some recommendations will be put forward as conclusions.

Linking University Social Responsibility (USR) and the Sustainable Development Goals (SDGs) at the Iberoamerican University: The Creation of the USR Seminar

The Iberoamerican University of Paraguay (UNIBE) is a privately administered autonomous university and the only Paraguayan institution in the national educational system to cover all levels of formal education. As a result, it is made up of a school called Colegio Iberoamericano and a teacher training institute named Instituto de Formación Docente Iberoamericano. The educational system's holistic point of view has permeated all of UNIBE's activities and initiatives. Consequently, the university has formed a strong connection to the community to which it belongs.

UNIBE is recognized locally as one of the leading universities in the area of social sciences and education. UNIBE was founded by Nidia Sanabria de Romero, a well-known Paraguayan educator and writer who was one of the first teachers to introduce the inclusive education approach in the Paraguayan educational system.

As part of its institutional roots, UNIBE performs the three main traditional roles of a university: teaching, research and extension. The university is also notable for the comprehensive education of its students and its promotion of an entrepreneurial spirit. It is clearly stated in the UNIBE's institutional mission that the university stands for: "A new mindset for a better world … through the training of proactive agents of change" (UNIBE, 2001).

This institutional mission statement encourages the university to adapt its functions to the needs of society, so it is worth asking: What has the university been doing to make a real contribution to a better world and a change of mindset?

In relation to this question, UNIBE has adopted an ongoing programme of social responsibility which covers all three main traditional roles of a university: teaching, research and extension. Initially, the implementation adopted an internal focus to understand the changes that were needed in the institution itself in order to enhance the relevance of social responsibility within the entire academic community and the local community as well.

Once the institution had established a solid base of social responsibility, the second phase of the process brought in other relevant actors: students, professors and local communities. At this point, the second institutional policy...
The objectives of the USR Seminar are to: a) Contribute to the search for solutions using an SDG approach to assess the problems that affect our society; b) Engage students and professors in real problems that are currently being faced by the local community; and c) Create awareness about the importance of democratic participation and social justice in local communities.

The USR Seminar follows a project-based learning methodology. First, undergraduate students learn what social responsibility and its characteristics are. Then they attend workshops on the social reality and on conflict resolution. Finally, students must implement a social project as a requirement to conclude the seminar. USR Seminars are purposefully intended to connect two institutional missions: teaching and extension. Once the seminar is finished, all the projects are presented at an open event for the community and stakeholders.

Initially, in order to promote the USR Seminar, forming alliances with stakeholders was paramount. One of the first allies was the Arovia Programme. Arovia was the first national volunteer programme conceived as a platform devoted to promoting access to information on public services and opportunities for the implementation of projects enhancing citizen participation and local government structures. Consequently, the projects undertaken during the first year of the USR Seminar were conducted by UNIBE with the Arovia state programme.

Since its implementation, the USR Seminar has achieved several goals:

a) Curriculum innovation: the incorporation of the USR Seminar has changed traditional classes by incorporating a new constructive teaching/learning model. Classes mostly follow the methodology of project-based learning, addressing conflict resolution and adopting an interdisciplinary focus with a cross-cutting approach. Moreover, this methodology helps students to learn more efficiently while also providing a wider perspective in order to propose comprehensive solutions. Team working skills are also enhanced by including students from different degrees in the same semester.

b) A total of 279 projects have been completed.

c) A total of 10 communities have been a beneficiary of these projects.

d) The UNIBE's third mission has been strengthened by consolidating a strategic alliance with the government, NGOs, the industrial sector, the business sector and the local community.

In light of these satisfactory outcomes, UNIBE's Office of the Rector decided that the USR Seminar must embody the SDG approach. Consequently, all projects must now incorporate a specific SDG.

In 2019, therefore, the USR Seminar incorporated a presentation of the SDGs and Agenda 2030 into its curriculum. To this end, it was very helpful for the university to become an active partner of the Paraguayan network of the United Nations Global Compact. This network involves a total of 108 participants, including representatives of industry, financial services, area business associations, small/medium-sized enterprises and universities. The university's participation in the UN Global Compact helped to build ties with stakeholders, NGOs and other institutions that have already worked with the SDGs, permitting the development of workshops on specific topics of the 2030 Agenda as part of the USR Seminar.

The experience of the USR Seminar linked to the SDGs was quite rewarding. A total of 516 students in the following degrees received the training: marketing, accounting, international commerce, administration, graphic design, law, psychology, psychopedagogy, mathematics, education sciences, nutrition, nursing, kinesiology and physiotherapy.

A problem-based learning methodology based on social projects, cooperative learning and action research was adopted for the implementation of projects, which were carried out across Paraguay's most populous region and beyond, including places like Asunción, San Lorenzo, Limpio, Villa Elisa, Luque and Pilar. This gave undergraduate students an opportunity to learn more about the realities of other communities outside of the city where the campus is located.
In 2019, a total of 516 students worked on 93 University Social Responsibility projects with a focus on the SDGs, while 8 teachers and 9 academic directors were trained in social responsibility with an SDG approach. Moreover, all of the projects were connected to one of the five elements of sustainable development: 76% of the initiatives referred to people, 10% to the planet, 8% to prosperity and 6% to peace. The next section will focus on a specific project: the work done with Paraguay’s Recycled Orchestra community.

**Learning from a Community: The Recycled Orchestra Case**

Through the USR Seminar, the university learned that the transfer of knowledge goes not only from the university to the community, but also from the community to the university. In 2019, one of communities chosen in the USR Seminar was Cateura. Cateura is a landfill in Asunción surrounded by four slums of the city. Recycling and garbage collection are the main activities of the people who live in Cateura. The living conditions in the slums are very poor, the level of poverty is very high and the proximity to the landfill adversely affects health conditions.

Despite all the difficulties encountered in Cateura, a group of former recycling workers under the coordination of an NGO started a project to make musical instruments from rubbish, specifically from things made of metal, iron or wood. In 2006, the orchestra started using these musical instruments under the leadership of a group of teachers, who taught music classes to children in the slums. In a few months, the children had learnt to play violins, cellos, saxophones, flutes and drums, all made from rubbish.

Since its creation, the orchestra has achieved satisfactory outcomes: it has been invited to play concerts and events all over the world. A documentary film of their story has been produced and famous artists like Megadeth, Stevie Wonder and Metallica have invited them to play at their concerts.

Working with the community that created the orchestra was a very rewarding experience for the university. Undergraduate students in the psychology, nutrition and nursing schools carried out projects related to SDG 3 (good health and well-being) and SDG 4 (quality education). These two SDGs were chosen after students conducted a diagnostic analysis that showed that the living conditions near Cateura not only affected people’s health, but also had an impact on their education. In return, the community showed the students how they made their instruments, thereby providing the students and professors an example of how to work on SDG 11 (sustainable cities and development).

Since completion of the USR Seminar, the link with the community has continued. Earlier this year, an agreement was signed by the Iberoamerican University and the Recycled Orchestra. Thanks to the agreement, some of the children in the community will receive scholarships to study at the university. In addition, the recycled orchestra will carry out workshops and activities at the university and a number of research groups will start work to learn more about Cateura and find ways to improve the living conditions there.

This experience serves as an example that University Social Responsibility should not merely be a statement of good intentions, but should involve hands-on programmes with long-term outcomes that connect society. In addition, signing the agreement achieved another SDG: the establishment of partnerships for the goals (SDG 17).

**Conclusions**

The experience of the USR Seminar at UNIBE proves that giving students an opportunity to make contact with the realities of communities as part of their educational process encourages their critical thinking. As an example, it is worth mentioning two of the comments made by students enrolled in the USR Seminar who took part in the projects: “(...) an incredible experience that fills your soul and makes you open your eyes” and “the realization of this project showed us our potential to work as a team, unifying our values and virtues in helping those in need...” Comments of this sort demonstrate a comprehensive educational training of responsible and supportive citizens undergoing a process that changes their way of thinking.

The impact and transformation of lives are evident at all levels, inside and outside the university.

To start working on the SDGs in a higher education institution, the first recommendation is to make the internal commitment to put them into practice. This requires a top-down approach that should start with the university authorities themselves.
The second recommendation is to make strategic allies, who could be local communities, public programmes or NGOs. It is very important to have a strong connection to stakeholders to ensure the long-term sustainability of any action or initiative that the university wants to undertake.

In conclusion, universities are key actors in social development and it is desirable for them to work as active members of global society. As Freire (1997) noted, “[t]o teach is not to transfer knowledge but to create the possibilities for the production or construction of knowledge” (p. 47). Therefore, any action that a university wants to initiate must be undertaken with an awareness of its social commitment to its own community.

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Visions of European Climate Landscapes for 2030: Developing Climate Change Adaptation Scenarios in TeRRIFICA Summer Schools

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TeRRIFICA project
Moving Towards Innovative Climate Action through Co-Creation

Climate change is the defining challenge of our time. Mitigating its impacts and adapting to changes already taking place or impossible to avoid will require fundamental changes to societies and behaviours all over the world as well as scientific breakthroughs, both technological and social (Climate Change Adaptation, Directorate-General for Research and Innovation, European Commission). In this context, the EU-funded project Territorial Responsible Research and Innovation Fostering Innovative Climate Action (TeRRIFICA) emerged to influence climate change mitigation and adaptation policies and foster competence for climate change adaptation and mitigation in six European regions. One focus is responsible research and innovation (RRI)\(^1\) and the co-creation of knowledge. In a transdisciplinary partnership, the H2020 project TeRRIFICA brings together three research institutions, three non-profit organizations, one public association of universities and one public institution for science promotion. TeRRIFICA is led by Wissenschaftsladen Bonn (Bonn, Germany) and the TeRRIFICA consortium is comprised of the Rhine-Waal University (Kleve, Germany), the Education for Sustainable Development Association (Minsk, Belarus), the Center for the Promotion of Science (Belgrade, Serbia), the University of Vechta (Germany), the Adam Mickiewicz University (Poznan, Poland), Sciences Citoyennes (Paris, France) and the Catalan Association of Public Universities (Barcelona, Spain).

\(^1\) https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation
Involving Citizens in the Agenda-Setting Process Corresponding to Climate Change Challenges

The issue of climate protection has reached the general public and many options for action are known from individual to political level. However, most citizens do not get involved in climate action to prevent (mitigation) or soften climate change effects (climate change adaptation) until they are personally affected by the consequences of climate change, in a heavy rainfall event, a severe flood, a drought or a tree-uprooting storm, for example. We all rely on resources or services provided by the natural world. The integration of environmental and climate concerns into a wider range of policy areas should generate solutions that are economically, socially and environmentally sustainable. There is no shortage of information about climate change. Despite controversial discussions among experts, conflicts of interests, varying opinions and differing interpretations, reliable information is available to stakeholders on all levels of interest. What is lacking is practice. This is where TeRRIFICA comes in, not to discuss climate change at any ‘meta-level’ but to foster competence for climate change adaptation, starting in pilot regions and cities.

Through creativity, networking and action, local and regional frontrunners can improve quality of life and help implement climate change innovations and processes. At the same time, governments and the international community need to intensify their commitment and efforts to improve climate change adaptation.

TeRRIFICA Crowdmapping Tool: Co-Creating a Climate-Friendly Region

To encourage stakeholders to identify personally with climate change adaptation strategies, the collaborating partners focus on areas in which the implementation of climate change adaptation measures can be started without elaborate technical equipment. In addition to a range of engagement methods, scenario workshops, and discussion forums to identify hot spots of climate change adaptation, TeRRIFICA will use maps with data added by citizens and local stakeholders: the crowd.

Crowdmapping tools are useful to identify stakeholders and key players in a given thematic context, to collect citizens’ observations and gather their knowledge. They can initiate stakeholder engagement and co-creation processes.

![Figure 1. Project participants](image_url)

TeRRIFICA’s crowdmapping tool is built as a web mapping application: a website with an interactive map. The map allows users to create spatially located information with the help of a geo-questionnaire. Eight language versions have been developed to make the tool usable and accessible to a wide range of stakeholders. The user interface was created using the principles of user-centred design. It was developed in three stages, in which internal and external tests were carried out with a group of 36 potential users from all partner regions.

Through the TeRRIFICA crowdmapping tool, civil society can pool efforts and help build a map that highlights a region’s main climate threats. The tool is based on a survey strategy. Participants are asked to indicate places on the map that they consider significant in terms of certain aspects of climate change: air temperature, water and wind circulation, and air and soil quality. These can be negative examples, i.e. areas in the region in which the adverse effects of climate change are already apparent, or examples of good adaptation or mitigation actions that have had a positive impact on the environment. Participants are also asked to recommend solutions to improve places that have been affected adversely. They may add comments that illustrate the significance of the place or problem. The goal is to co-create a map that shows problems and highlights actions that administrations and civil society might consider a priority, to foster competence for climate change adaptation and mitigation in Europe.

Any public participation of stakeholders in the data collection process must be followed by public inclusion in the implementation of actions.
Based on the identified hot spots, the territorial partners will develop, test and evaluate specific actions (pilots) focused on mitigation and adaptation to climate change issues. Activities will be implemented with the stakeholders who pointed out the specific hot spot. They will also involve various other actors, creating new tools for governance innovations and decision-making processes for climate change adaptation and mitigation in the territorial context.

TeRRIFICA’s Pilot Regions

The pilot regions participating in TeRRIFICA were chosen carefully to provide a panorama of the future adaptability of the results, measures, actions, recommendations and any other output from the project. Each region or city has its own characteristics, features, climate challenges and policies that contribute to the project’s landscape as a whole. These are described below together with activity highlights and the outlook for the 2019-2020 period, according to the partners.

• Barcelona Metropolitan Area

The Barcelona Metropolitan Area is comprised of 36 municipalities, including the city of Barcelona, and has a population of 3.2 million inhabitants. It is the largest metropolitan agglomeration in the western Mediterranean, where half of the GDP of the region of Catalonia is generated. It is mostly developed (48% of its 636 km² is urban) but also includes woodlands and other natural spaces (the Massís del Garraf, Serra de Collserola and Serralada Marina mountains) and a protected agricultural zone (the Delta del Llobregat). It has two rivers (the Llobregat and the Besúss) and 25 km of coast.

The main climate challenge affecting the Barcelona Metropolitan Area is the expected increase in temperatures (between 1.9 °C and 4 °C depending on the scenario), which will intensify the conditions of warm, torrid days and tropical, torrid nights. These phenomena affect infrastructures, economy and health, particularly in the vulnerable population. Other major climate challenges are changes in rainfall patterns that increase drought, water scarcity and fire risk, and sea level rise, which increases flood risk. The government bodies that manage Barcelona Metropolitan Area have the following targets: carbon neutrality by 2050, increased use of renewable energies and enhanced adaptation and resilience of the territory.

The main climate policy initiatives on which the urban authority (Àrea Metropolitana de Barcelona, AMB) is working are the Climate and Energy Plan 2030 including the Carbon & Energy Management Strategy 2030, the Climate Change Adaptation Plan, the Metropolitan Observatory for Climate Change (METROBIS), the environmental education programme Sharing our Future, the Pact of Mayors for Climate and Energy and specific temperature studies.

As part of the TeRRIFICA project, in June 2019 the Catalan Association of Public Universities (ACUP) with the support and advice of the AMB and an expert on citizen participation from the University of Girona (UdG) formed a team from a wide range of stakeholders. Members include university academics and researchers on climate change, as well as representatives of public administrations, the private sector, civil society and the media. Since then, several activities based on climate action and co-creation of knowledge have been organized with the involvement of the team, in partnership with local institutions (Barcelona City Council, RISC Climate Change Knowledge, ICTA-UAB, CREAIF, ISGlobal, IERMIL, etc.). Due to the lockdown measures against the Covid-19 pandemic, some of these activities have been postponed or adapted to online formats.

• Belgrade

Geographically, Belgrade belongs to the Balkan Peninsula. Its geographical position is very favorable, and besides Athens, it is one of the largest urban areas in the Balkan Peninsula.

In Serbia, the climate change situation is similar to that of other countries in the region in terms of the challenges that are faced. For this reason, the Center for the Promotion of Science (CPN) project activities include the entire territory of the Republic of Serbia, as well as six neighboring countries: Albania, Bosnia and Herzegovina, Croatia, Hungary, Montenegro and Romania.

Extreme weather events, heat waves and droughts have affected Belgrade frequently in the past, with serious, sometimes disastrous consequences. Due to the urban heat island effect, Belgrade has had the highest increase in average annual temperatures in the Republic of Serbia: 0.20 °C/decade in the period 1949-2009.
The Republic of Serbia belongs to the group of developing countries (Non-Annex I Parties) that report on their actions to mitigate climate change and adapt to changing climate conditions. Currently, the Third National Communication and the second Biennial Update Report are under preparation. Some crucial documents are still in the process of being adopted: the Law on Climate Change and the Climate Strategy and Action Plan.

Belgrade developed the Climate Change Adaptation Action Plan with Vulnerability Assessment in 2015. A high priority was given to flood protection, green infrastructure, water resources and heat islands in the city centre. In 2019, a co-creation team was established and consultative workshops were held on climate issues. As a result, the focus was shifted to the question of heat islands as a major issue in the urban environment. All stakeholders agreed that this issue was relevant and manageable. For 2020, the plans are to continue with the co-creation team’s work, but to involve citizens to an even greater extent. The most important objective is launching and promoting the crowdmapping tool. Some activities have been postponed until autumn due to the Covid-19 crisis, but it is still foreseen and possible to hold meetings and implement plans, since the summer is a target period for the Belgrade pilot region.

Brittany, Pays de la Loire and Normandy

The French TerRIFICA pilot region covers three administrative areas on the west coast: Brittany, Pays de la Loire and Normandy. Large cities such as Nantes and Rennes are located in these regions. However, most of the area is rural and agricultural with a specific traditional landscaping form, the bocage, which are small irregular fields bordered by hedgerows. Numerous climate effects threaten the regions, including water scarcity and negative farming impacts, biodiversity depletion and migration, coastal erosion and sea level rise, heat waves and lastly the risks caused by the nuclear industry in the Loire Valley. There are already a number of climate policies in place at almost every administrative level. For example, strategies are being developed or have already been defined among municipalities, and the national strategy on low carbon from 2015 is currently being revised.

However, the co-creation team chose to centre and build on a project called RESP HAIES to promote and maintain hedgerows. This is a key climate adaptation, due to the wind break effect and hydraulic regulation provided by hedgerows. It is also a mitigation solution, as hedgerows act as a carbon sink and provide renewable energy through wood chips. The aim was to improve farm resilience and involve every stakeholder in the process. The Agriculture Ministry Plan for the Development of Agroforestry (2015-2020) supports bocage sustainability.

Researchers in geography, sociology, agronomy, ecology, technical consultants, educators, cooperatives of wood sellers, producers and buyers, the national association Alac-Agroforesteries and a regional Agriculture Chamber are co-creating to produce knowledge and tools to provide solutions to climate change through hedgerows.

As part of its TerRIFICA activities, Sciences Citoyennes aims to facilitate the co-creation process among these stakeholders by enhancing reflexivity and providing co-creation methods. For instance, at the start of the project, the stakeholders drew up a collective timeline on hedgerow history to share their knowledge and ideas from various perspectives (research, education, technical aspects, perception, policies and regulation). A chronology of hedgerows had been lacking, and a side project emerged to produce a publication.

Minsk

Minsk is the tenth most populated city in Europe. It is the largest economic and industrial city and the biggest transport hub of Belarus. Its area covers 348.84 km² and the population is around 2 million people.

The main ecological challenges of the region are the following:

- Air and soil quality. The main pollution sources, like automobile and machinery manufacturers and transport hubs, are located in the grey zones, which make up almost 35% of the city (Frunzensky, Zavodsky and Partizansky districts). In winter, the public utility providers still apply harmful chemicals to control snow and ice on the roads.
- Wastewater management. Some industries still discharge untreated effluents. The city has problems with the final disposal of sewage sludge, due to the limited productivity of landfills.
PART VI - Social Impact through SDGs: Transforming Communities

- Green areas. Minsk has around 20 parks and green zones, but the new neighbourhoods still lack substantial tree cover and green spaces. In addition, urban growth has had a negative impact on habitats and biodiversity.

- Climate change mitigation and adaptation. Despite Belarus national commitment to counteract climate change, there is no clear climate change policy at city level. The absence of transparent procedures for data collection and proper measures based on these data hampers the decision-making process at national level.

The Education for Sustainable Development (ESD) Association coordinates the TeRRIFICA project in Belarus. Along with other civil society organizations like IPO Ecopartnership and the Interakcia Foundation, which support the Covenant of Mayors for Climate and Energy in Belarus, it implements various co-creation activities to foster stakeholders engagement in the development of Minsk’s climate agenda.

In 2019, the TeRRIFICA project in Belarus was focused on data collection, mapping stakeholders, testing the crowdmapping tool and developing behaviour change methodologies based on best practices and tools in climate mitigation and adaptation. In 2020-2021, the aim is to educate teachers and young activists as multipliers who can engage local communities and relevant stakeholders in climate change adaptation and mitigation practices. Various actions have been planned for this period in Belarus: educational activities such as Climate Workshops (trainer training and a five-module course), a crowd mapping tool (proposed for Minsk schools), the Climathon Young Innovators in partnership with the Climate KIC, European Knowledge and Innovation Community, and a national Summer School for young researchers and climate activists, along with co-creation events like Climate Discussion Clubs and round tables at university conferences.

- Oldenburger Münsterland

The pilot region Oldenburger Münsterland consists of the counties of Cloppenburg and Vechta and is in the northwest of Germany, in the federal state of Lower Saxony. The region is conveniently situated on a north-south road axis, but the public transport network is poorly developed. In contrast to many other rural areas in Germany, the population of Oldenburger Münsterland is still increasing. The agriculture and food sector play a major role in the region's economy, with well-connected production, distribution and processing centres. Almost 70% of the region is dedicated to agricultural activities. Oldenburger Münsterland has the highest concentration of processors of intensive animal farming in Germany. Therefore, the meat production value chain (pork and poultry) and related climate challenges are a focus in this pilot region. Climate change adaptation strategies are emerging slowly in Oldenburger Münsterland. Awareness of climate change mitigation and adaptation still has to be improved. Current actions include public tree planting, and sustainable development and climate change education in schools. Local governments have started programmes to reduce energy consumption.

- Poznan Agglomeration

As one of the oldest and largest Polish cities, Poznan is the historical capital of the Wielkopolska Region where the Polish state was born over 1,000 years ago. Today, Poznan is an important national and European centre of industry, trade, culture, higher education and science. It is also one of the leading Polish cities in terms of economy. It has a privileged position, due to its geographic location and transport links in Europe and Poland. Poznan is the meeting place of east-west and north-south transportation routes, including the pan-European transport corridors from Berlin to Moscow and from Gdansk to Prague. The city is half-way between Berlin and Warsaw, 160 km from the Polish-German border.

The Poznan agglomeration is comprised of Poznan and the 17 neighbouring municipalities forming a system of two rings around the city. It is characterized by its highly urban nature of outlying areas, strong social and human capital, a busyant and well-developed labour market, a dynamic economy, an established transportation network and a high level of attractiveness for tourism. The region benefits from rich natural resources, as 28% of the area is legally protected. In the metropolitan area, a characteristic wedge and ring system of greenery can be distinguished. The main green wedges extend from the suburban area to the city centre along the Warta river valley and its tributaries, and along the post-glacial valley of 70 lakes.
The Poznan agglomeration has developed and implemented a common development strategy and sectoral policies, including social issues management, water and sewage management, waste management, adaptation and mitigation of climate change, flood protection and rainwater management.

In the Poznan agglomeration, the main threats associated with climate change are increases in:

- Average annual air temperature and intensification of the effect of urban heat islands
- The frequency of extreme events: heat waves, cold waves, droughts, intense rainfall and associated flooding, flood threats, strong winds and storms
- Emissions, especially in heavily urbanized areas, as a result of obsolete heating technologies and uncontrolled, chaotic suburbanization

The present challenges for the Poznan agglomeration are reflected in the development of new urban policy (the Urban Climate Adaptation Plan for the City of Poznan to 2030, the Strategy for Rainwater and Meltwater Management for the City of Poznan, the Low Carbon Economy Plan for Poznan Metropolis [LCEP]), focused on climate change adaptation and mitigation actions. The challenges include, but are not limited to:

- Air quality: threat of exceeding the permissible concentrations of PM10 and PM 2.5 and the harmful effects of smog on residents' health
- Water management: systematic, complex approach to rainwater and meltwater management
- Spatial planning: supporting investments in green infrastructure (including forests, river valley vegetation, parks and other biologically active areas) that provide a range of regulatory services

TeRRIFICA Summer Schools

TeRRIFICA’s action phase will explore possibilities. It will build on the future visions of a climate landscape in 2030 and focus on exploiting the possibilities for action suggested by various actors in the pilot cities and regions and beyond. In the framework of the TeRRIFICA project, six national and one international Summer School will be organized.

National Summer Schools

The national Summer Schools will be preceded by transdisciplinary exchange of experience on local climate issues in flexible formats (such as webinars, seminars and workshops) that include “Interventions”. The schools will be held in the 2020-2021 period in each pilot region, according to local activity plans.

They will be based on findings from the first project year (2019), encompassing best practices and case studies from pilot regions. The findings are drawn from co-creation in the field of climate adaptation and mitigation processes (TeRRIFICA’s Case Studies Report, the Guidebook on Co-Creation and Engagement and the Stakeholder Mapping Report, among others) and the interim results of crowdmapping.

The group that is targeted in national Summer Schools will include young researchers and climate activists. In addition, mentors and stakeholders will be invited, so that they can experience the co-creation process with the younger generation.

The main aim is to develop ideas for a positive future vision of the cities’ climate landscape 2030. Specific targets include:

- Formation of tandems of young researchers and non-researchers (climate activists) to develop climate adaptation scenarios based on local challenges and hotspots, identified through crowdmapping
- Creation of a positive picture of the necessary climate adaptation measures
- Involvement of national Summer School participants in practical seminars and other activities of local Living Labs
- Communication of capacity building needs for other formats (surveys, excursions and crowdmapping actions) in the area of climate action and related topics.

The visions of climate landscapes 2030 will be published as the results of the Summer Schools and feed into the political discussion at local levels.
These future visions will illustrate where science and society can collaborate actively and how responsible research and innovation can be integrated into Climate Actions. They will demonstrate that new forms of innovation can be co-created in an open environment of exchange. The visions will also deliver methodologies and scenarios for use in other regions.

International Summer School

At the international Summer School in 2022, which will be a preliminary event to the final European TeRRIFICAsymposium, a shared youth vision of a European Climate Landscape 2030 will be developed – based on the visions developed in national Summer Schools. The results of this work will be published in the second TeRRIFICAs policy brief.
Part VII – Innovative Social Engagement through Service Learning
Abstract

Social responsibility is one of the competences that is least integrated in higher education. Official course plans usually do not take into account this third mission and leave it to students to undertake volunteer actions. But we are not just training future professionals, we are also educating citizens, and social responsibility must be firmly embedded in higher education to enable new professionals to consider social and environmental needs in their work.

A good way to integrate social responsibility into universities is through service-learning. Service-learning is an educational approach that combines learning objectives with community service to provide a progressive learning experience while meeting societal needs.

Our project has introduced service-learning into the Environmental Sciences degree at the University of Barcelona, through the subject of Sustainable Development. This is a multidisciplinary subject, in which students learn how population, nutrition and social metabolism determine the development of societies and influence environmental and social sustainability. Since 2016, our students have collaborated with social organizations to solve problems related with the sustainable development of their nearby environment. With these projects, they learn about several issues associated with the Sustainable Development Goals and work locally to introduce them and address daily life problems associated with sustainability.

Since the introduction of service-learning in the course, our students have increased their learning in competences such as teamwork, communicative ability and learning ability, and have incorporated social responsibility as an important part of their future professional careers.

Service-Learning at Universities

Since the implementation of the European Higher Education Area and to change the university learning model that this has led to in recent years, interest in rethinking university education has been spreading among university staff. The new approach includes the need to expand the scope of universities’ training actions and highlight and improve their relationship with society. Consequently, an increasing number of teachers have incorporated pedagogical methodologies based on experiential, meaningful learning, linked to direct action in society, such as service-learning.

Service-learning is a pedagogical methodology that combines learning processes and service to the community in one, well-structured activity (Martin et al., 2018). Rather than focusing on preparing students for a particular job, service-learning prepares students for practical community-based problem solving. It offers students an opportunity to explore the connections between the theoretical realm of the classroom and the practical needs of the community (Heffernan, 2001).
Service-learning can be incorporated into the main missions of universities, which are teaching, research and knowledge transfer, to highlight the relevance of social responsibility as an integrating axis (Martínez, 2008). Service-learning increases the participation of educational institutions such as universities in their environment, especially by promoting coalitions and generating resources with and for the community in response to its needs (Brown, 2001).

Service-learning projects significantly improve students’ learning. Contact with the reality that surrounds them improves students’ understanding of social complexity and contributes to the development of their own identity as future professionals who are more competent and committed to their surroundings. Teaching work is enhanced by service-learning projects: teachers update first-hand their knowledge and experiences, and adapt their research and way of teaching to real social needs (Naval, 2008).

The Subject of Sustainable Development

The term “sustainable development” was first used in 1987, following the Brundtland Report of the United Nations (UN), which warned of the negative consequences that economic growth and globalization had on the environment and tried to find solutions to the problems caused by industrialization and population growth (Brundtland, 1987; Keeble, 1988). Sustainable development meets the needs of the population without compromising those of future generations and ensures the balance between economic performance, environmental care and social welfare (Robert et al., 2005). We can gather from its definition that sustainable development is a complex issue, covering ecological, economic, demographic, social, health and educational aspects.

Consequently, since its genesis, when the degree in Environmental Sciences was first introduced at the University of Barcelona, the subject of Sustainable Development has been multidisciplinary, involving teachers from different departments and faculties who tried to offer this complex vision of sustainability. Thus, teachers from the faculties of Biology, Economics and Business, and Geography and History designed and taught contents that allowed us to analyse the past, present and future of our society from the perspective of sustainability. The Sustainable Development course addressed demographic growth, social metabolism, food and human health and proposed using citizen participation as a strategy of change. Over the years, the course results have been remarkable, and the subject is interesting to students, according to surveys. Nevertheless, students did not consider that they were dealing with a complex issue, but working on different issues in the same subject. In other words, they did not understand the connections between the areas. In addition, students have always requested more field work and greater contact with social reality to get to know more about it first hand, to see what they would face in their professional lives. Our perceptions as teachers were similar: students’ learning processes would be enriched by talking, analysing and working with social organizations that have sustainable environmental and social goals, who could offer our students their knowledge on sustainable development. This kind of significant learning also generates a positive attitude towards dialogue with people, which is important in our students’ future work as environmentalists.

In 2015, to coincide with the implementation by the UN of the 2030 Agenda on Sustainable Development (United Nations General Assembly, 2015), the team of teachers transformed the subject into a service-learning project that will help students understand the facets of sustainable development by working directly on specific aspects of the SDGs. To achieve this, we contacted several social entities that work in very different areas of sustainability, from neighbourhood associations to NGOs in defence of the territory, social companies and environmental entities. Likewise, we have the approval of the Studies Council and the Head of Studies for the Environmental Sciences degree, as well as the support of the decanal team.

Currently, the subject consists of two parts: very short theoretical training of about 16 hours, in which we review the Sustainable Development Goals (SDG) proposed by the UN and the basic concepts and approaches of sustainability; and a second stage in which the students work on a project for three and a half months. In this second part, groups of four students must collaborate with a social entity whose activity is related to any of the SDGs. Together, they develop a project related to the interests of the entity that contributes to the sustainable development of its environment. During this second stage, the role of teachers becomes that of accompanying tutors: several tutoring sessions are held in small groups to address doubts, encourage the exchange of ideas between students, detect possible problems in the relationship between entity and students, and guide
participants towards the achievement of a project that satisfies everyone.

Students present their projects in three sessions in the Aula Magna of the Faculty of Biology, at an event open to the entire faculty. These presentations are considered in the evaluation process. Evaluation covers the theoretical block of the subject, an initial project report and presentation, attendance and participation in tutorials. In addition, entities evaluate students through specific questionnaires. An important part of the assessment analyses teamwork, which is essential for the development of future professional projects. We wanted to strengthen teamwork as a synergistic tool to achieve objectives and not, as often occurs, merely as the sum of several parts. The evaluation of teamwork considers each student’s involvement in the project, their initiative, contribution and ability to accept criticism. Finally, to prevent students from only examining the theoretical part of the subject that is linked to their own project, the members of each group evaluate the work done by another group that has worked on a different issue. In this way, a critical spirit is encouraged.

One issue that worries us is this atomized evaluation because it leads to a clear decrease in the distribution of marks. It is difficult to fail the subject, but at the same time it is very difficult to obtain a high mark. This situation can be found in other teaching experiences with continuous, atomized evaluation. It worried us from the outset, but perhaps it is nothing more than a reflection of reality: some students stand out in some aspects and other students are notable in others, but it is very unusual to be very bad or very good at everything. Thus, we decided to continue with this evaluation system.

Results After Three Years

The results in the first three years of application of the project are very positive. Through questionnaires, we consulted students from the first two years of the project on their perceptions of learning and compared the answers with those of students from the previous course (Table 1). This analysis highlighted the deeper internalization, understanding and ability to analyse sustainability-related concepts in the new course, as concepts can be related to a real specific context, put into practice and tested for their applicability. We can also observe an improvement in skills acquisition. Students considered that they acquired greater critical and self-critical capacity, and developed their communication skills, their ability to search for information and their autonomy. In addition, at quantitative level, the transformation of the subject led to an improvement in the results: the average mark obtained by students increased by over 1.2 points out of 10. Students considered that their analysis of problems improved due to population-environment interaction and the association between the population’s knowledge and its impact. This is probably one of the focal points of the Sustainable Development subject and we found that service-learning was a great pedagogical strategy to achieve this understanding.

However, probably the best indicator of improvement was students’ level of commitment to the subject, the projects and the collaborating social entities. Students increased their perception that they can actually improve their environment with their actions, and that small gestures can have a great impact. Many of them have continued cooperating with the entities, in some cases as volunteers, or they have focused their final degree project on collaborations with social entities. In some cases, they got a job on graduation due to the projects carried out in the subject.

We now have a list of 16 social entities that collaborate with us. Their level of satisfaction is very high. Actually, most of them repeated the experience after the first time. In some cases they consider direct contact with the university as recognition of the work they do, which is often undervalued. In addition, contact with students helps to revitalise their approaches or their methodologies. They greatly appreciate the fresh approach as it allows them to reach an audience that was often beyond their reach.

Finally, the project enables teachers to find out first-hand about the work of civil entities, their problems and needs, and the work they carry out. This improves teaching and research work, since it helps to focus on real societal challenges.
Results After Three Years

The incorporation of service-learning projects in university education is an effective tool to improve student learning, but also a key element in achieving university social responsibility and forging a greater connection between university and society. The mission of achieving the Sustainable Development Goals is a great opportunity to decide to work with civic and social entities, to improve our environment together. However, this should not make us lower our guard; we must ensure the quality of the projects that they want to carry out. We will only achieve the set objectives if we develop complete projects that consider all the necessary factors for a good result.

Service-learning shows us that a more satisfactory way of teaching is possible, with results that transcend the classroom, leave an imprint on the community and transform us as professionals and as people. The challenge is great, but the benefits are even greater.

Table 1: Students’ perceptions of the degree of learning achieved and the overall impression of the subject in the academic years 2015-2016 (prior to the application of the project), 2016-2017 and 2017-2018

<table>
<thead>
<tr>
<th>Subject Competences</th>
<th>2015-16</th>
<th>2016-17</th>
<th>2017-18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical and self-critical analysis</td>
<td>7.6</td>
<td>8.0</td>
<td>7.9</td>
</tr>
<tr>
<td>Oral expression</td>
<td>6.8</td>
<td>7.7</td>
<td>8.2</td>
</tr>
<tr>
<td>Search for information</td>
<td>6.8</td>
<td>8.0</td>
<td>8.7</td>
</tr>
<tr>
<td>Association between consumption and health</td>
<td>7.7</td>
<td>8.2</td>
<td>8.3</td>
</tr>
<tr>
<td>Causes and consequences of impacts</td>
<td>7.1</td>
<td>8.0</td>
<td>8.4</td>
</tr>
<tr>
<td>Association knowledge-population and impact</td>
<td>7.8</td>
<td>8.3</td>
<td>8.8</td>
</tr>
<tr>
<td>Social and urban conditions</td>
<td>6.9</td>
<td>8.0</td>
<td>8.4</td>
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<table>
<thead>
<tr>
<th>Subject Topics</th>
<th>2015-16</th>
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<tbody>
<tr>
<td>Key concepts</td>
<td>7.7</td>
<td>7.7</td>
<td>8.3</td>
</tr>
<tr>
<td>Rates and indicators</td>
<td>71</td>
<td>6.9</td>
<td>77</td>
</tr>
<tr>
<td>Methodologies</td>
<td>71</td>
<td>8.2</td>
<td>8.7</td>
</tr>
<tr>
<td>Participatory processes</td>
<td>71</td>
<td>6.3</td>
<td>8.7</td>
</tr>
<tr>
<td>Problems of population-environment interaction</td>
<td>78</td>
<td>6.8</td>
<td>8.3</td>
</tr>
<tr>
<td>Tools and reference sources</td>
<td>6.6</td>
<td>7.8</td>
<td>8.4</td>
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<table>
<thead>
<tr>
<th>Overall Impression</th>
<th>2015-16</th>
<th>2016-17</th>
<th>2017-18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohesion among the parts of the subject</td>
<td>6.3</td>
<td>7.5</td>
<td>7.7</td>
</tr>
<tr>
<td>Agreement with the subject</td>
<td>72</td>
<td>8.6</td>
<td>9</td>
</tr>
</tbody>
</table>

References


Final Degree Projects: from Looking at the World through the Window to Starting to Change it. A Powerful Tool to Develop Sustainable Development Goals

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Abstract

The final degree project in the Faculty of Biology, University of Barcelona (UB), is associated with Practicums I and II. Together, these three subjects comprise a total of six-hundred face-to-face hours. They are taken annually by about five-hundred degree students. Through this project-based learning opportunity, students undertake placements in research groups, the UB or foreign universities, or in companies, town halls, foundations and other civil and social entities. Every project has a lecturer from the faculty who acts as a tutor in the learning and training process. We analysed projects developed during the 2017-2018 course to determine their contribution to the SDGs. Overall, final degree projects had an impact on 12 of the 17 SDGs. These projects were carried out mainly in social entities and involved service-learning methodologies. Topics included environmental education, scientific dissemination, responsible production and consumption, biodiversity, land restoration and sustainable cities and communities. A final survey to assess students’ experiences showed that they value the final project for the professional training it provides and for the opportunity to address projects that have a social impact, from which to build a new global, critical vision of society and their own profession. In view of the results, during the new course, students are asked to include a diary in their final project report in which they critically assess the impact of their project on the SDGs. We expect students to put ethical commitment and sustainability at the heart of their professional activity. Final projects are powerful tools to build transversal competences that are often poorly developed and evaluated in degree programmes. Furthermore, they provide a great opportunity to encourage students to reflect on how their future profession can impact the sustainable development of humanity.

The initiative

More than ever, higher education institutions need to rethink learning-teaching activities in line with the Sustainable Development Goals (SDGs) (Jongbloed et al., 2008). The SDGs are an approach to sustainable development and a tool for addressing global problems in a collaborative (United Nations, 2015; Saito et al., 2017; Yonehara et al., 2017), interconnected way (O’Byrne et al., 2015).

Here we present initiatives taken by the University of Barcelona’s (UB) Faculty of Biology to support the sustainable development goals (SDGs) in its bachelor’s degree curriculum and practice. Specifically, we address whether innovative education activities undertaken as part of bachelor’s degree final projects can help to bring students to the centre of the learning process and achieve sustainable development goals.

The implementation of the European Higher Education Area (EHEA) focused on student skill acquisition and promoted professionalization of the teaching-learning process. In response, the University of Barcelona’s (UB) Faculty of Biology designed for its five new bachelor’s degrees in Biology, Biochemistry, Biotechnology,
Environmental Sciences and Biomedical Sciences a block of three compulsory subjects with thematic continuity that together comprise 24 ECTS (600 study hours). The subjects are Practicum I and II, each worth 6 ECTS, and the final project (FP), worth 12 ECTS. In these subjects, students are challenged to develop a project based on a place where they may work in the future. Our bachelor’s degree structure has what we call the Final Degree Project Window so that the 24 credits can be taken in the second semester of the fourth course. This enables students to carry out their projects in research groups at the UB, foreign universities or specialized research centres, or in companies, town halls, foundations and other civil and social entities. This experience provides all students with deep immersion in a real workplace (Llorente et al., 2014).

The Faculty is committed to this system, since it promotes the professionalization of students, increases employability, strengthens relationships with external entities, companies, institutions, NGOs and other organizations, and transfers knowledge to society. Broadly speaking, 40% of students carry out their final projects in external entities, 30% in UB research groups and the remaining 30% within international mobility programmes. Altogether, 70% of students choose to do the final project outside the UB, which shows the great interest of students in having practical experiences in workplaces connected to society. Every year, nearly 500 students defend their final projects, which are mentored by about 330 external supervisors and 250 faculty supervisors. Each project is evaluated by an examination panel formed of three lecturers. About 70 examinations are held a year involving a total of 225 lecturers. Thus, we have implemented a knowledge network around the final project that impacts over 1100 people every year.

Ten years after implementation, the subjects of Practicum I and II and the final project have been consolidated as a system to acquire professional skills and competences. They are highly valued by students taking the degrees offered at the Faculty of Biology, and the degree in Biomedical Sciences taught jointly at the Faculty of Biology and the Faculty of Medicine. The vast diversity of the offer allows our students to choose projects in numerous fields and with either scientific or technical profiles, according to their preferences. In parallel, the teaching staff have made a great commitment, as the project has been accepted as an institutional strategy that increases the teaching quality (Sauras-Yera et al., 2019).

Soon after the adoption of the 2030 Agenda by UN Member States, we analysed how students worked during their final project, to improve indicators and achieve the objectives. For the first time in the 2017-2018 academic year, we evaluated the impact of the Sustainable Development Goals (SDGs) on final projects. SDGs were identified based on keywords in the title and/or a summary of each project in a written report. The results showed that of the 471 final projects, 25% (117 projects) directly addressed one of the SDGs. Some of these were applied research projects and service-learning projects. The rest were basic research projects that mainly impacted knowledge about people’s health and life on land or below water.

Although service-learning projects were not specifically promoted at the time, they comprised 10% of the total or 47 projects that were associated with the SDGs. To evaluate the use of service-learning methodologies, we considered whether the project was developed within a social entity or in a community and whether its conclusions resulted in a direct improvement or service for the community. The learning was considered implicit. The projects that were identified were fundamentally about environmental education and science dissemination, citizen participation, sustainability plans of companies and entities, ecological restoration, organ donation, sustainable fishing and waste management. The entities involved were public government institutions and agencies, private foundations, research centres and small companies. During the development of their projects, our students were active participants and gained skills such as communication, autonomy, teamwork, critical thinking and problem-solving. In addition, if they carried out service-learning projects, social awareness and a sense of civic responsibility were worked on actively.

The above description of final projects indicates that SDGs are a very powerful element for assessing cross-cutting skills of vital importance, such as a critical spirit, sustainability and social responsibility. However, according to a survey of 255 fourth-year students, only 30% were aware of the SDGs before they started their final project. Exceptionally, 75% of Environmental Sciences students were well-informed about SDGs, as Sustainable Development is a compulsory subject in their course that applies service-learning methodology within the SDGs framework. Only 15% of students on the remaining four degrees stated that they knew what SDGs were and what they represent. These results highlight the need to implement specific actions in the faculty to increase the knowledge and involvement of students and teachers in SDGs.
Consequently, we launched an innovative education project to motivate students and supervisors to implement and illustrate SDGs in final projects and to encourage students to actively reflect on their role as professionals in human development to build social awareness and a sense of civic responsibility. In the current academic year 2019-2020, we are implementing actions so that students can become more aware of their involvement in the SDGs through a reflective process, using a protocol guide to consider whether a specific SDG has actually been worked on in their final projects. Students can decide and state which of the SDGs have been addressed. These SDGs are displayed on the cover of the final project report, which must also reflect on the project’s impact on society, identifying the project contributions and the ecosystem and/or community that has benefited directly and indirectly and how this impact is determined and made visible in the framework of the SDG.

Eighty per cent of the projects presented in the 2020 call in February included the SDGs that had been addressed along with an analysis of the actions involved and the corresponding reflection. The students all found the reflection interesting because of the chance to “deal with the social impact of your own work”, “think how your work is good for society”, “help you to visualize the final goal of your job” and “adapt the conceptual context to the project”. The 20% of students who did not include SDGs in the project gave reasons such as “no SDGs fitted with my job” (Biomedical Sciences students) or “I thought SDGs only involved projects on environmental issues” or simply “I had no time”. The reflection sections were well-argued and reasoned despite teacher supervision. These findings are still preliminary, since most students will defend their final projects either in the July or September call. Therefore, at the end of the academic year we will have a complete figure and dataset to analyse the impact of our innovative education project on SDGs.

These findings are still preliminary, since most students will defend their final projects either in the July or September call. Therefore, at the end of the academic year we will have a complete figure and dataset to analyse the impact of our innovative education project on SDGs. According to the Catalan Association of Public Universities (ACUP, Vilalta, 2018), if Catalan public universities could educate their approximately 240,000 students in relation to the 2030 Agenda and the SDGs, the social commitment of universities on a local and global scale could be considered to have been achieved. Universities are driven in changing attitudes and assuming new values for a better world. The University of Barcelona’s Faculty of Biology is committed to training and transforming the approximately 2,500 undergraduate students who are enrolled.

References
Part VIII – Teacher Training: Seeds for Transformative Competencies
Implementing Education for Sustainable Development in Higher Education

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Abstract

The United Nations’ Sustainable Development Goals (SDG) call for a new model of learning for the twenty-first century. Formal education must be transformed to foster the new forms of learning that are needed to tackle complex global challenges. The internationalization of higher education echoes this call by highlighting how the multilingual and multicultural learning spaces of universities today need to be leveraged explicitly in pedagogical strategies to facilitate transformative learning among students. An internationalized curriculum can contribute to developing quality education as defined by SDG4, by helping students to intentionally develop skills that make them interculturally aware, global citizens, who are prepared to contribute to sustainable development. In order to deliver education for sustainable development (ESD) as defined by SDG4.7, universities must provide students with transformative learning experiences.

However, it is unclear to what extent university teachers are prepared for and equipped to design and deliver the learning necessary to achieve SDG4.7. There is an urgent need to support university teachers to meet this goal, as it is becoming increasingly clear that the call for a new model of learning requires new pedagogies and a transformed role for the university teacher. This paper discusses how universities can meaningfully contribute to achieving SDG4, particular through university teacher development. With a focus on quality education, we discuss the relevance of internationalization of higher education when the role of higher education teachers is reconsidered in the era of the SDGs.

Introduction

In the spring of 2019, high school students across Sweden, Europe and the world went on school strike to protest against global inaction over the climate crisis. Climate change is one of the most urgent global challenges facing humanity right now. Inequality, poverty, human rights abuses, war and conflict are equally as urgent, depending on where and how one lives. Across the world, many people face these challenges simultaneously, making them both urgent and complex at the same time. In 2015, the United Nations’ Agenda 2030 recognized the need to address these issues holistically. Societies clearly need to develop, but that development needs to happen in an economically, ecologically and socially sustainable way, as outlined in the 17 interdependent Sustainable Development Goals (SDGs) to be achieved by 2030 (2015). As the young people involved in Fridays for Future enter higher education, we may wonder how universities will respond to the need for an education that is directly engaged with, and relevant to, the wicked challenges of sustainable development (Block et al., 2019).
This paper discusses how universities can meaningfully contribute to achieving SDG4, the goal that specifically addresses quality education, with a focus on university teacher development. We discuss the relevance of internationalization of higher education to quality education, in terms of the new role of higher education teachers in the era of the SDGs. We address the knowledge, skills and values that should be prioritized within higher education and the professional development strategies that will enable teachers to deliver quality education for all learners. We end the paper with recommendations for the next steps in the continuing professional development of teachers in higher education institutions.

A Call to Revisit the Internationalization of Higher Education

The Fridays for Future movement are a generation of young people who were at school during the Decade for Education for Sustainable Development (2005-2014) and are now entering universities that have strategically prioritized the internationalization of higher education in recent decades. In these universities, internationalization is perceived as a means of adding value and quality to university learning (Marinoni, 2019). Today, the UN Agenda 2030 requires us to revisit the concept and meaning of the internationalization of higher education. We must question how we internationalize, for example, the impact of international mobility on the environment and climate change; what we do and to what end; and more specifically, what we achieve through university education. We should examine the overlap between the SDGs, specifically SDG4, and the internationalization of higher education, which can be further leveraged to develop transformational, quality education that is inclusive and equitable for all. We will explore this connection further below.

To examine this connection, we use the following definition of Internationalization in Higher Education for Society:

“The intentional process of integrating an international, intercultural or global dimension into the purpose, functions and delivery of post-secondary education, in order to enhance the quality of education and research for all students and staff, and to make a meaningful contribution to society”

(our italics) (De Wit et al., 2015).

The movement to decolonise the curriculum and the critical discussions of conventional understandings of multilingualism and diversity that are taking place across campuses (Kamanzi, 2016), as well as social polarization and a rise in nationalist political movements should all inform the way universities approach education, both through content and didactics. For higher education, this means providing education that allows students to develop knowledge, skills and attitudes to address the specific nature of sustainability challenges. Higher education institutions must gain the capacity to take a 360° view, value different ways of seeing, doing and being, and promote global citizenship that is both inclusive and reflective. Guiding principles for such a move in education have been highlighted in the Agenda 2030. While this may provide an ambition that is admirable and hopeful, it is important to recognize that valuing different ways of being and doing is not trivial and necessitates a process that requires human and capital resources. In order to balance realistic expectations and high ambitions, strategies are needed that plan clearly for gradual progression towards this aim.

What is Education for Sustainable Development?

Agenda 2030 explicitly states that all SDGs are interdependent and together provide the basis for quality education, which by definition should offer a transformational learning experience (UNESCO, 2017). The specific goal for education, SDG4, states that by the
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By 2030, we must “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (United Nations Knowledge Platform, n.d.). Target 7 addresses how quality education must include education for global citizenship, human rights, gender equality, appreciation of cultural diversity and culture’s contribution to sustainable development (UNESCO, 2017). Educating for the implementation of SDGs is closely aligned with the broader, well-established field of education for sustainable development and much can be drawn from existing experiences in this field. The incorporation of values and perceptions of sustainability into education not only in terms of disciplinary content, but also in everyday personal and professional life, is a way to empower people to resolve common issues and to challenge global society’s collective life (Waas et al., 2012). Schools have partly addressed this through the Decade for Education for Sustainable Development, but tertiary education has come to it rather late. Emerging thinking on education for sustainable development underlines that developing pluralistic approaches and an openness to a range of norms and values is fundamental to effective engagement with sustainability challenges (Block et al., 2019). For higher education, this means going much further than placing Education for Sustainable Development on the curriculum; it implies a major shift in the way education is approached.

The Overlap between Education for Sustainable Development and Internationalization of Higher Education

One of the ways in which the internationalization of higher education and education for sustainable development overlap is through the shared focus on a holistic approach to education and the systems in which it operates. The importance of addressing and becoming aware of one’s own values and perspectives, as well as the emphasis on participatory pedagogies, are aligned with the purpose of including, valuing and learning from many perspectives (UNESCO, 2011; Leask and Carroll, 2013). However, until very recently, “the meaningful contribution” (De Wit et al., 2015) of internationalization has mainly been linked to the impact of student mobility, an activity which concerns no more than 5% of students across the globe (UNESCO, n.d.). Today, the emergence of global citizenry (Francois, 2017), internationalization at home (Nilsson, 1999, Beelen and Jones, 2015) and internationalization of the curriculum (Leask, 2015) are pushing the boundaries of that understanding, to widen student engagement and make internationalization more inclusive by embedding it into learning and teaching in an integrated manner as an intentional, value-driven practice. However, this is highly dependent on the engagement of academic staff, educational policy, curriculum reform and ultimately classroom practice. While there is strength in engaging the widest possible community in the “internationalization” of teaching and learning to develop core intercultural and global competences, there is also weakness, since to lead this process in a given local contest the global has to become locally significant for all actors involved (Francois, 2017). Agenda 2030 and the SDGs are contributing to further this understanding.

A Gap in University Teacher Training

Certainly, many universities are fostering their engagement with SDGs through green campus initiatives and actions in research and education. There are now rankings, networks and classifications available. The Horizon Europe Green Deal provides an even stronger impetus and will guide research and innovation in Europe for decades to come. Many universities are positioning themselves through strategies that align with the SDGs (Karolinska Institutet, 2019; SLU, 2019). Universities need to consider the ways in which they help societies to achieve the SDGs, and how they are responsible for delivering and achieving SDG4 on quality education. In other words, “It is vital not only to include SDG-related contents in the curricula, but also to use action-oriented transformative pedagogy” (UNESCO, 2017, 58). While UNESCO has specified the key competences that students need to become “sustainability citizens” (2017, 10), there is limited literature on what this means for the development of their teacher competence. This leaves universities with considerable dilemmas about educating their professionals to help prepare graduates for a sustainable future. Who is supposed to deliver this transformative education? And are these people trained to do so? It is here that there is an opportunity to build on the experiences of internationalization in higher education, specifically internationalization of the
curriculum and internationalization at home. Rather than making a complete switch from internationalization to SDGs, universities should now seize the opportunity to align strategies and activities that are already in place through internationalization, to understand where education needs to be further developed to really provide inclusive, equitable quality education that connects local to global.

Harnessing Diversity for Sustainable Development

Over the past decade, the diversity in all our classrooms has become increasingly relevant to how and what we teach, with important implications for higher education across the globe. Recent data shows that “one in ten persons living today in the OECD is foreign-born, among youth, more than one in five has immigrated or is native-born with immigrant parents” (Gurria, 2018). These statistics have been rising virtually everywhere. Social diversity and inequality have been debated across and within the Global South, as well as the Global North. Additionally, our classrooms are becoming more sensitive to sexual and gender diversity, to physical ability, age, religion, values and beliefs. In some countries, there has been an increase in legal recognition and anti-discrimination laws, while others have experienced a conservative backlash. Diversity, equity and inclusion are not only relevant to students, but also to university staff in academia and administration. Given that these stakeholders often lack updated knowledge on the issues listed above (IGLYO, 2015), this may be a factor which unintentionally reproduces unsustainable practices and patterns of behaviour.

Diversity can be a great asset in the classroom if teachers can utilize and leverage the knowledge and diversity that it brings, including the issue of language. Higher education institutions must understand, respond to and harness the complex realities of all their students, whether local or global. In so doing, they must leverage the lived experiences of their students to foster inclusive pedagogies, creative ways of thinking about learning and innovative approaches to assessment, in a spirit of reciprocity. In spite of the uncertainties of our time, educators should not hesitate to aspire to, plan for and create situations where all our students develop local, international and global perspectives. Rather than forcing students to understand other cultures and make them believe that the encounter of different cultures and viewpoints inevitability leads to conflict, exposure to multiple perspectives should enable students, as well as teachers, to develop skills to navigate the complexities of the world (Wals, 2016). Such approaches will result in sustainable ways of thinking about unity in diversity (Dreamson, 2017). The major challenges facing world societies today, such as the emergence of the ultra-right, xenophobia, radicalization and anti-intellectualism, can effectively be addressed when people are open to different perspectives about beliefs, norms and attitudes (Brandenburg et al., 2020).

Therefore, university teachers need to be trained adequately to meet the needs of quality education, so that they can:
1. Design new pedagogical approaches that lead to quality education for all.
2. Choose from a repertoire of varied pedagogical approaches (scenario-based learning, problem-based learning, critical pedagogy, inquiry-based learning, value-based learning, personalized approaches to learning and improving cross-cultural knowledge, among others).
3. Create conditions for students to have cultural experiences, including considering how to create inclusive spaces inside and outside the classroom.
4. Make this an explicit action of teaching, rather than an implicit one.

Teacher Competences and Continuing Professional Development

Education’s ultimate goal in the context of internationalization of higher education and education for sustainable development is for students to be empowered to make a meaningful contribution to society. This means developing the capacity for critical engagement with the pressing issues of our time and creating “learning spaces for the development of qualities such as care, empathy and solidarity” (Peters and Wals, 2016: 183). We should therefore seek to develop a set of interlinked, transversal competences that underscore the need for flexibility and adaptation and include: asking critical reflective questions, clarifying your own values, envisioning more positive futures, systems-thinking, responding through applied learning, and exploring the dialectic between tradition and innovation (UNESCO, 2011; Weik et al., 2011). The development of change...
makers is only feasible if these perspectives are explicitly integrated into graduate attributes and intended learning outcomes that are constructively aligned with teaching and learning activities and assessment (Biggs and Tang, 2011).

Asking our students to critically examine their “socially constructed values” (UNESCO, 2011: 31) and the power structures and biases behind largely unsustainable societies will require difficult conversations and critical incidents that our teachers must be prepared to manage. The United Nations Economic Commission for Europe (UNECE) expert group provides us with some clues regarding what this preparation might entail in terms of competences for teaching staff:

- Domain 1: Learning to know is defined as “understanding the challenges facing society both locally and globally and the potential role of educators and learners”.
- Domain 2: Learning to do is defined as “developing practical skills and action competence in relation to education for sustainable development”.
- Domain 3: Learning to live together “contributes to the development of partnerships and an appreciation of interdependence, pluralism, mutual understanding and peace”.
- Domain 4: Learning to be “addresses the development of one’s personal attributes and ability to act with greater autonomy, judgement and personal responsibility in relation to sustainable development” (2011: 14-15).

These four domains are each subdivided and organized around key characteristics of education for sustainable development: a holistic approach, envisioning change and achieving transformation, which serves to change the way people learn and the systems that support learning.

It is clear that the role of teaching staff in university settings has changed, as have expectations of teachers. This list of competences emphasises how educators must make a clear link to pedagogy and teaching practices: not only what, but also how they are teaching to successfully infuse curricula with education for sustainable development and develop the next generation of problem solvers (Zelinski, 2018). Continuing professional development should therefore aim to develop teachers who are open to multiple ways of knowing and unknowing, as an appreciation of what interdependence and mutual understanding might entail. Moving away from the accepted decade-old pedagogical frameworks, educational developers who train university teachers will need to examine the epistemic virtues of openness, curiosity and humility to sharpen their ability to take unprecedented risks (Rizvi, 2008). A useful example of this can be found in the recent Erasmus project EQUIP (EQUIP, n.d.) which identified a set of values, attitudes and knowledge for educational developers training teachers who teach in multilingual and multicultural classrooms in higher education institutions. Most importantly, the quality of educational practices through the continuing professional development of teachers will be enhanced by favouring research-based scholarship of teaching and learning and encouraging the use of reflection instead of relying on personal anecdote (Båge and Valcke, forthcoming). Flexible pedagogies and new approaches to assess students’ capabilities, values and knowledge will need to be part of the ongoing experiential learning for teachers as well as students.

Transformative experiences are personal journeys. Teacher competences need to be revisited, as do the expectations and understanding of their role, and ultimately their professional identity (Hanson, 2010). University teachers, whose traditional identity has been one of the “expert in the room”, now have to “present themselves as fallible human beings rather than people with all the answers” (UNECE, 2011: 17). They need to be able to safely step outside their comfort zones while questioning their own ways of thinking, being and doing.

**Conclusion and Recommendations**

We began this paper by asking how universities can respond to the need for an education that is both directly engaged with, and relevant to, the wicked nature of sustainability challenges. We conclude by saying that there is an opportunity to build on the work of internationalization of the curriculum and internationalization at home, to develop relevant teaching and learning strategies so as to enable universities to deliver on SDG4.

Below is a list of recommendations for teachers, teaching teams, educational leaders and developers in higher education institutions to reflect on and consider, in order to become inclusive and equitable so that their students can make a meaningful contribution to society. However, we are acutely aware of the obstacles that limit
universities’ implementation of these recommendations, including a lack of continuing professional development provision for university teachers in certain countries, as well as the belief that academic expertise is confined to disciplinary expertise and that this is enough for teaching. It is also important to consider the formal and hidden curriculum, institutional ethos, and attitudinal transformation of teachers and learners regarding education for sustainable development.

• Achieve a balance between knowledge, skills and values across the curriculum, more specifically:
  - Design and revise intended learning outcomes so that they reflect an international, global, and/or intercultural perspective and dimension, especially in compulsory courses so that related competences are assessed (Båge and Valcke, forthcoming).
  - Be explicit when learning processes and outcomes are communicated to students.
  - Revise pedagogies and teaching practices in alignment with intended learning outcomes.
  - Consider how assessment may be inclusive.
  - Consider progression across courses in a programme of study (Jellinek, 2018: 42) so that teachers may be trained and assessed over time.
  - Work towards a clearly defined shared set of graduate attributes, aiming for the development of globally-minded citizenry.

• Value, develop and incentivise continuing professional development that allows teachers to:
  - Develop and become comfortable in their role as facilitator, rather than just an expert, and in supporting students with critical incidents and difficult conversations.
  - (Re)develop inclusive, equitable teaching philosophies.
  - Reflect on the use of language for inclusive learning, paying attention to the situated nature of learning and relevant pedagogic approaches within your own teaching contexts.
  - Share resources for teaching-learning for mutual support among teachers across institutions/countries, such as the use of inclusive virtual learning.
  - Develop approaches that inspire complex thinking, leave room for uncertainty, confront values and require problem-solving.

• Encourage students to become partners in the production of knowledge and in constructing learning design (see CEMUS for an example of a student-driven, inter-university initiative).

• Break disciplinary silos in order to foment interdisciplinary, multidisciplinary or transdisciplinary dialogues (Iwinska et al., 2018).

This paradigm shift can take place via alternative curricular designs that enable knowledge, teaching-learning activities, and assessment to prepare learners to challenge the normalization of inequality, knowledge capitalism that focusses on possibilities for the few, and the narrative of education for employability. A balance between knowledge, skills and values should therefore be present across higher education curricula. To achieve this, universities need to create opportunities for epistemic openness, offering students and teachers the space to co-design knowledge for a highly uncertain present and future by developing inter-perspective pedagogies (Welikala, 2013). Rigid ways of thinking about knowing and outdated theories of learning will need to be replaced with radically different ways of thinking about living, learning and researching that employ new and inclusive methodologies (Kumar and Pattanayak, 2018).

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Abstract

Education for sustainability in higher education requires the development of competences in university teachers. However, teachers may lack tools and strategies to introduce sustainability into their professional development. Mentoring is proposed as a strategy to promote this process, based on a reflection-action model: new teachers analyse their practice and propose improvement strategies guided by a mentor (a senior teacher who is an expert on sustainability), whose function is to provide support, resources for reflection and information exchange and proposals for improvement in this field.

Following an assessment of the situation, a pilot study was designed to analyse the suitability of the mentoring process as a training strategy for new university teachers in sustainability competences.

Action research was carried out in which, through a teacher training proposal, a spiral action-reflection model was proposed, so that teachers could distinguish different levels of difficulty and address classroom experiences.

Background

Mentoring

Mentoring is defined by Johnson and Ridley (2018) as the personal and reciprocal relationship in which a more experienced person (mentor) acts as a guide, role model, master and academic sponsor of another less experienced individual person (mentee). In teacher training, a senior member of academic staff acts as the mentor for new teachers. The mentor provides knowledge, advice and counselling, establishes challenges and supports the mentee in the search to achieve proposed milestones.

Following this precept, mentoring new university teachers is a task of vital importance for universities (Olmo-García et al., 2015). Universities that use this training strategy benefit from the value of the senior staff that accompany new teachers during the early stages of their careers.

Mentoring processes are an ideal channel for new teachers to immerse themselves in teaching practice in a satisfactory way. Mentoring programmes help reduce the uncertainty of teaching staff and minimize the risk of putting research ahead of teaching, which leads to higher quality in university teaching (Wang, 2001). Therefore, it is important to create training proposals that allow new teachers to develop professionally, and to create learning spaces that help them gain knowledge, competences and skills. New teachers should be encouraged to adopt attitudes that help to provide high quality training practice (Sánchez et al., 2015).

Sustainability Competences

The new educational model within the European Higher Education Area (EHEA) is based on teaching-learning competences, promoting critical thinking, contextualization, action and social cohesion among students (Cebrian and Junyent, 2014). This new scenario is ideal to incorporate competences related to...
sustainability and to link them to the teaching-learning processes of each university discipline, to advance towards the attainment of the United Nations’ Sustainable Development Goals (SDGs) (UN, 2015).

During the last decade, many studies have proposed sets of competences for sustainable education. In the context of the training programme and this research, we have employed a mixed model that includes the contributions of various authors (Poza et al., 2019; Welke et al., 2015; Cebrián and Junyent, 2014; Murga-Menoyo, 2015). The list of competences is as follows:

- **Systemic thinking**
  - Recognizing and understanding relationships, identifying and connecting the ecological, economic and social dimensions of a problem.

- **Anticipation**
  - Understanding and evaluating multiple future scenarios, looking for alternative paths and changes for the future.

- **Legislation**
  - Understanding and reflecting on the norms and values that underlie our actions towards sustainability.

- **Strategic thinking**
  - Contextualizing actions that promote sustainability, identifying both the spatial (local-global) and temporal (past, present and future) dimensions of problems.

- **Collaboration**
  - Learning from others, understanding and respecting the needs and opinions of others, and solving problems in a collaborative and participatory way.

- **Critical thinking**
  - Questioning norms, practices and opinions, and reflecting on values, perceptions and your actions.

- **Self-awareness**
  - Reflecting on your local and global role, evaluating your actions, and managing emotions and feelings.

These competences enable individuals to reflect on the effects of their actions at social, economic, environmental and cultural levels, under the “think globally, act locally” premise that leads to the creation of sustainable societies (Poza et al., 2019).

To work towards SDGs through the incorporation of competences linked to sustainability in higher education, teachers must thoroughly restructure their teaching processes. In university teacher training, this challenge must be faced by incorporating in training programmes actions focused on the inclusion of sustainability and SDGs in the teaching guides of university degrees.

The training programme described below was designed to use the mentoring process as a training tool to help new teachers to incorporate sustainability principles into their teaching practice.

**Training Programme**

The training programme at the core of our study was designed to contribute to the institutionalization of sustainability in educational innovation programmes. It was created to achieve the following goals:

- Raise the university community’s awareness of the importance of sustainability.
- Promote coordinated actions of university sustainability in the fields of teaching, management and research.
- Develop synergies with the University of Granada’s existing institutional sustainability initiatives that are part of its Sustainable Campus Programme.
- Identify good practices in university sustainability.
- Incorporate sustainability competences in teacher planning.
- Design collaborative actions to draw up continuous university sustainability programmes.

**Research objectives**

The main objective of our research was to design an innovative training programme to strengthen the professional development of new university teachers at the beginning of their careers. The programme was also intended to be a starting point to improve the teachers’ sustainability competences by engaging in collaborative work with senior lecturers.

The specific objectives of our exploratory study were:

- Analyse the suitability of the mentoring process as a strategy for training new university professors in sustainability competences.
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- Promote a professional development environment for new teachers at the University of Granada and other professors interested in incorporating sustainability into their teaching practice.
- Allow experts in the field of sustainability in higher education to discuss with new teaching staff how to incorporate sustainability into their teaching practice.
- Develop a first level of mentoring on sustainability in higher education, to create workspaces and action networks that improve this practice in the university context of the city of Granada.

Methodology

Programme Methodology

The training programme is based on a progressive spiral including phases of improvement that revolve around the introduction of sustainability into teaching (Figure 1). This type of improvement spiral is being applied in training programmes for new teachers to enhance their teaching by identifying threats and key aspects to understand and give meaning to the teaching process.

Figure 1. Diagram of spiral methodology. Based on Kemmis, S. & McTaggart, R. (1988)

These programmes are based on reflection-action phases in which the new teachers analyse their practice and propose improvement strategies. The process is undertaken within an interdisciplinary working group formed of new and experienced teachers who improve in parallel. The training group is guided by a mentor whose function is to offer resources for reflection and exchange, as well as proposals for improvement. The starting point of an improvement phase can be a specific problem proposed by the new teacher or a specific subject proposed by the entire group. The model is conceptualized as a spiral that allows differentiation between levels of difficulties, so that teachers gain experiences that progressively increase in complexity.

During the programme, a portfolio was used as a tool to facilitate the reflection-action of teachers participating in the course, with questions for reflection such as: What am I doing? What can I do? Who can I do it with? What do I need to do? What improvements do I generate if I do it? This enabled them to analyse their teaching guides and to study how to incorporate sustainability into their teaching practice from innovative proposals (Figure 2).

Figure 2. Main aspects of the portfolio developed by teachers in the programme.

Research Methodology

On completion of the training programme, we asked participants to reflect on the competences they found most useful to improve their teaching process. To gather the results of this reflection process, the participants were asked to fill out a questionnaire, in which they indicated the degree to which they had incorporated sustainability competences into their teaching. The questionnaire was based on a Likert scale where the available answer options were 1 (not at all), 2 (somewhat), 3 (quite a lot) and 4 (a great deal). The questionnaire results are shown in Table 1.

Participants

The training programme was taken by thirty teachers. Among those who answered the questionnaire, a third were men and two thirds were women (Figure 4), with different types of contract and from different disciplines. Figure 5 shows that the highest percentage of participants were from the health sciences (44.4% of participants).
followed by social and legal sciences (22.2%), art and humanities (22.2%) and engineering and architecture (11.1%).

Results

The questionnaire results show that the mean values of the Likert scale were all above two. This means that all competences were put into practice by the teachers participating in the course. Table 1 lists the average score for each of the competences in descending order. The results indicate that participants had successfully incorporated sustainability into their teaching practice on completion of the course. The portfolio reflections corroborated this result, as we will see later in the document.

Table 1. Average scores for sustainability competences incorporated into teaching practice by new teachers on completion of the training programme

<table>
<thead>
<tr>
<th>Competences</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration of sustainability in curriculum plans and teaching activities</td>
<td>3.500</td>
<td>0.527</td>
</tr>
<tr>
<td>Planning and introduction of sustainability competences in the subjects of my knowledge area</td>
<td>3.500</td>
<td>0.726</td>
</tr>
<tr>
<td>Design of learning activities focused on sustainability aspects</td>
<td>3.500</td>
<td>0.527</td>
</tr>
<tr>
<td>Knowledge of sustainability issues</td>
<td>3.400</td>
<td>0.766</td>
</tr>
<tr>
<td>Planning and carrying out of innovative projects</td>
<td>3.400</td>
<td>0.766</td>
</tr>
<tr>
<td>Management of teaching resources for sustainability</td>
<td>3.400</td>
<td>0.766</td>
</tr>
<tr>
<td>Critical thinking</td>
<td>3.300</td>
<td>0.500</td>
</tr>
<tr>
<td>Valuing and respecting diversity</td>
<td>3.300</td>
<td>0.707</td>
</tr>
<tr>
<td>Design learning methodologies and discovery learning</td>
<td>3.300</td>
<td>0.707</td>
</tr>
<tr>
<td>Cooperative work in a heterogeneous group</td>
<td>3.300</td>
<td>0.707</td>
</tr>
<tr>
<td>Shaping of curricular practices</td>
<td>3.300</td>
<td>0.440</td>
</tr>
<tr>
<td>Integration of knowledge, participation and affectivity/emotions</td>
<td>3.200</td>
<td>0.666</td>
</tr>
<tr>
<td>Anticipation thinking</td>
<td>3.100</td>
<td>0.600</td>
</tr>
<tr>
<td>Ability to discover unknown options</td>
<td>3.100</td>
<td>0.781</td>
</tr>
<tr>
<td>Valuing knowledge frontiers</td>
<td>3.000</td>
<td>0.900</td>
</tr>
<tr>
<td>Futuristic thinking</td>
<td>2.800</td>
<td>0.666</td>
</tr>
<tr>
<td>Acting fairly and ecologically</td>
<td>2.800</td>
<td>0.585</td>
</tr>
<tr>
<td>Tolerance of frustration</td>
<td>2.800</td>
<td>0.585</td>
</tr>
<tr>
<td>Systems thinking and complexity management</td>
<td>2.700</td>
<td>0.815</td>
</tr>
<tr>
<td>Awareness of innovation</td>
<td>2.700</td>
<td>0.707</td>
</tr>
<tr>
<td>Communication and use of technologies</td>
<td>2.700</td>
<td>1.000</td>
</tr>
</tbody>
</table>

The results show that the most reinforced competences were those linked to the incorporation of sustainability into curriculum plans based on activities, contents and work related to each teacher’s discipline (Figure 5).
As mentioned above, the teachers explained in their portfolios how they had incorporated sustainability into their teaching practice. A content analysis of the portfolios revealed:

- After reflecting on their teaching, teachers usually found that they already included and worked on sustainability in a cross-cutting way in their daily practice, although they were not fully aware of it.
- In some cases, teachers already tackled sustainability in the main learning objectives of the subjects they taught, and in other cases they addressed sustainability in the contents of their classes.

After the teaching programme, new teachers became fully aware of the need to incorporate sustainability into their teaching discourse. Therefore, they decided to include changes into their teaching practice from different perspectives:

- Incorporate teaching objectives and content related to sustainability and Sustainable Development Goals.
- Opt for more participative methodologies that generate reflection processes to bring about change amongst students.
- Establish more sustainable evaluation proposals in which students are active stakeholders.
- Start research lines and supervise bachelor and master’s degree theses related to any of the Sustainable Development Goals.

These findings help to shed some light on the reality of teachers and how they work with practical situations related to the development of sustainability competences in the areas of teaching (preparation of teaching guides, design of activities and evaluation protocols, among other activities), management (implementation of sustainability measures linked to decision-making) and research (co-direction of bachelor’s, master’s and doctoral thesis projects).
Participants

Our work concludes that the analysis of teaching practice and the support process carried out by senior teachers who are experts on sustainability can help new teachers to improve their practice and incorporate sustainability into their professional work, regardless of the discipline and educational level of students. The training programme was found to be a valuable tool to trigger a reflection process that helps teachers to identify how relevant competences can be transmitted to students by incorporating sustainability into their practice.

Finally, we can conclude that the following future lines of research and action can be established:

• Write a guide to good practices in sustainability in higher education for new teachers.
• Continue to promote a sustainability approach in the New Teacher Training Programme of the University of Granada.
• Create a stable working group (a permanent seminar) for mentoring.
• Disseminate the experience to the entire university community.
• Involve more teachers from different areas, departments and universities.
• Make changes in teaching, curriculum planning, management and research methodologies, and include sustainability as a standard practice for members of the university community who have less than ten years of experience.

References


Part VIII – Teacher Training: Seeds for Transformative Competencies


Part IX – Responsible Research for the SDGs
The Affordances of Design Thinking and Online Collaboration Tools in Environmental Problem Solving

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Abstract

Design thinking, which emphasizes user needs, abduction and rapid prototyping, is a promising avenue in sustainability. When employed in design thinking, online collaboration tools can facilitate the joint construction and resolution of a problem. With help from facilitators, adults in four case studies worked on problems such as adapting a university campus to the needs of international students, improving a drinking water problem, adapting to floods and decontaminating groundwater. The researchers studied the affordances of design thinking and of Facebook, Realtime Board and Knowledge Forum during the resolution of these problems. Some affordances of design thinking were: a broader understanding of problems, the identification of real users’ needs, mutual learning, caring towards users and the proposal of appropriate solutions. Information and communication technologies (ICTs) have proved to be promising tools to support problem-solvers at a distance: Facebook, to share images of disasters and solutions; Realtime Board, to visualize a whole problem and to remember its details; and Knowledge Forum, to analyse a problem.

Introduction

Environmental problems affect citizens, who then need to find solutions to improve their living conditions. Sometimes facilitators accompany citizens in their quest. What are the key interventions that promote effective support for citizens in their pursuit of applicable solutions? Environmental problems are complex; they have multiple causes, actors and risks. Some international organizations currently use a creative problem-solving approach called design thinking to assist social groups pedagogically as they analyse local problems, propose solutions and test them. Some facilitators also use online collaboration tools to help problem-solvers think collectively and represent situations and solutions. Design thinking, which comes mainly from the IDEO design and innovation firm, is a creative, collaborative way of working in which intuition matters, solutions are numerous, the identification of real users’ needs are considered (Brown, 2009). Generally, in design thinking, facilitators use traditional tools such as post-its, whiteboards, role plays, etc. Today, facilitators also use online collaboration tools (ICTs) to co-create solutions during design thinking. Using ICTs, problem-solvers can better share and synthesize information, propose and comment on ideas, build prototypes and communicate. However, there is little research on the potential benefits of technological tools in design thinking.
According to IDEO.org, Hasso Plattner Institute and Design for Change, design thinking can lead to the creation of products and experiences that improve the lives of communities. What exactly are the pedagogical impacts of design thinking? And how can technologies facilitate design thinking? This research project seeks to answer the question: What are the affordances of design thinking and online tools in environmental problem solving? The concept of “affordances” corresponds to the values and potentialities of actions perceived by a living organism towards a given object (Gibson, 1979). Four case studies helped to answer the research question. Firstly, Moroccan women used design thinking and Facebook as they sought adaptation solutions to the poor quality of their drinking water as a result of recurring floods. Secondly, University of Ottawa education students used design thinking and Realtime Board in their aim to improve their campus environment to better meet the needs of international students. Thirdly, at Laval University, students in the education faculty used design thinking and Knowledge Forum to solve a drinking water problem in Quebec City. Finally, engineering students at the University of Moncton used a design thinking approach in their attempt to solve an issue of contaminated groundwater. No specific online collaboration tools were used at the Moncton site, where students instead preferred more familiar communication tools.

This paper presents the perceived affordances of design thinking and of Facebook, Realtime Board and Knowledge Forum that have been collected from problem-solvers and facilitators in the various experiences.

Materials and Methods

Design Thinking

Design thinking uses both creative and analytical modes of reasoning. It follows specific, but non-linear steps in which back-and-forth actions intersect. The steps described in Figure 1 below are inspired by Brown (2009) and Scheer, Noweski and Meinel (2012):

1. Observation-inspiration: a survey helps to understand the people who are concerned about a problem (the users) and the situation.
2. Definition-synthesis: the problem is defined several times and synthesized to pose the conceptual challenge.
3. Ideation: ideas are proposed and some are chosen.
4. Prototyping: prototypes are quickly constructed to illustrate the ideas.
5. Tests: prototypes are assessed by collecting the opinions of users and experts. The winning prototypes are refined.
6. Communication: the chosen solution is made public.

ICT Tools

Studies point to the benefits of digital technologies in problem-solving. More specifically, ICTs are used mainly to promote the sharing and dissemination of information and to facilitate the emergence of shared and effective solutions (Barborska-Narozny, Stirling and Stevenson, 2016). In general, online tools can play an important role in areas such as project coordination, popularization and citizen engagement.

Methods

The perceived potentialities of design thinking and ICTs were sought from participants and facilitators in four case studies in which adults attempted to solve local environmental problems. The problem-solvers and facilitators were asked to explain what the design thinking approach and the use of online tools contributed as potentialities for action or learning. The data sources were: the written and graphic artefacts left by participants on their preferred ICT adjunct (i.e. screenshots), individual and/or group interviews with problem-solvers and facilitators (at various points during the experience), and the researchers’ journals. At each case site, two researchers carried out the qualitative analysis of data, which consisted of applying Paillé and Mucchielli’s (2008) thematic content analysis approach, mainly involving the extraction of common themes.

In the first case study, ten Moroccan women were supported as they tried to find solutions to a problem of unsanitary drinking water caused by floods (Pruneau et al., 2017). Facebook was used as a networking tool when the women were at a distance. The women shared photos and videos of their flood experiences on Facebook and then attempted to solve the sub-problem of unsafe drinking water. In the second case, a group of engineering students used a design thinking approach at the University of Moncton to solve an issue of contaminated groundwater. The students preferred more familiar communication tools instead of using specific online collaboration tools.

From Brown (2009) and Scheer, Noweski and Meinel (2012)
drinking water. Along the way, users’ needs were identified and a single common concern emerged: the problem of diseases caught from water that was contaminated by waste transported by the floods. The conceptual challenge was: How can we reduce the amount of waste in the water? The women implemented the following solutions for flood adaptation: making filters, making compost, creating recycled jewellery (from plastic waste) and starting a waste reuse cooperative. All solutions were shared and assessed during workshops and on Facebook.

The second case involved seven pre-service teachers at the University of Ottawa (the problem-solvers) working on how to make the campus more sustainable for the well-being of international students (the users). The problem-solvers used Realtime Board as they attempted to identify the various needs of international students specifically related to the campus, such as a lack of vegetation, meeting places, entertainment venues and places representative of their culture. During meetings and through weekly entries on Realtime Board, the participants proposed the following additions to the campus environment: pergolas, trees, swings, ping-pong tables, working spaces, shaded socializing places, trails, art and a garden of international flags.

The third case involved pre-service teachers (the problem-solvers) at Laval University who were dealing with water quality issues in Quebec City. Eighty-four students worked collaboratively in groups of four, using the digital platform Knowledge Forum (KF) for an entire semester. Users identified two main needs, namely a lack of information on the part of citizens as to the existence and seriousness of the problem at hand and a need for better protection of watersheds. Several proposals were made in response to the need for heightened user awareness of the problem. For example, an educational programme for Quebec City parks could help to raise awareness about water use and overconsumption, while an educational kit used by a “beach squad” could serve to educate navigators on the fragility of local streams. Some teams stressed that regulation was part of the problem and should be adapted to protect sources of drinking water.

In the fourth case, design thinking was used with civil engineering students at the University of Moncton to solve the problem of high arsenic levels in the groundwater of a village. The conceptual challenge was to find solutions to treat water in any wells containing high levels of arsenic. The students verified whether the residents’ wells had arsenic concentrations above the acceptable limit. They subsequently realized that the arsenic concentration varied sharply from one well to the next. It was recommended to each well owner to take a water sample and assess it to determine whether it was necessary to proceed with a technical solution. The students then proposed solutions such as a reverse osmosis treatment system, a distillation system and the distribution of water bottles. Interestingly, the design thinking process led to a wider range of solutions, which included some less technical proposals.

Results

Affordances of Design Thinking

Design thinking is seen as a tool that can provide a deeper understanding of a given problem. Before the experiment, the Moroccan women mentioned that they did not know the causes of the floods in question, nor the health risks of domestic waste in the river. Ottawa students did not anticipate most of the needs expressed by international students regarding university campus development. Quebec City students were not aware of any drinking water issues and initially showed little concern, admitting that they had an impression of the resource’s “overabundance”.

The Moroccan women, Ottawa students and future engineers at Moncton also considered design thinking to be an efficient way to identify the real needs of people. They felt that the process facilitated the formulation of appropriate solutions. Empathy was another affordance attributed to design thinking. A feeling of kindness towards the users’ needs emerged. When speaking about users, the problem-solvers said that they wanted to find solutions “for them and with them”.

The four groups of participants also believed that with design thinking, solutions were better and more original since they addressed the users’ needs. The approach allowed for the enrichment of individual’s ideas (“Together we did better!”) and it supported an openness to new and more innovative ideas (“Let the imagination go!”). According to the Ottawa students, prototyping brought ideas to life, contributing to the quality of the proposed ideas (“This visual support gives us a better idea of what the space would look like”). The Moncton students said that spending more time listening to user concerns led to less conventional non-technical solutions to a water contamination problem, from a civil engineering perspective.
Lastly, design thinking improved communication. The groups of problem-solvers became cohesive as their knowledge and their desire for action developed.

**Affordances of Technological Tools**

Facebook was used in the case study involving the Moroccan women (on the topic of floods), while Realtime Board was used with the Ottawa students (on sustainable campus development) and Knowledge Forum was used with the Quebec City students (on drinking water contamination).

**Facebook**

A Facebook page usually shows a list of members' posts: images, emoticons, videos, Internet links and text. In the Moroccan project, the types of Facebook posts were chosen by both the facilitators and the problem-solvers. Over the course of the project, Facebook’s affordances were discovered and gradually exploited by both parties. Thus, various aspects of the case problems and their solutions were documented and commented on, one at a time, by the members of the Facebook group (including the facilitators). According to the participants, Facebook presented the following affordances:

- Communication tool
- Tool for progressively defining the problem
- Learning tool (how to compost, how to craft)
- Empowerment tool
- Tool for sharing and critiquing solutions and prototypes
- Planning tool (exhibitions, compost and jewellery sales, management of the cooperative).

**Realtime Board**

Realtime Board (RTB) is an online whiteboard that allows users to collaborate by writing and drawing on a shared screen. Tables, concept networks, a chat option, stickers, emoticons and comment bubbles are all available. On RTB, problem-solvers were invited to represent each user’s needs in a network of concepts (see Figure 3), to collaborate online, to co-build the empathy card, to synthesize all users’ needs, to propose conceptual challenges, to vote for a challenge, to generate solutions, to evaluate and transform ideas, to vote for the best solution, to share pictures of prototypes, to assess the chosen solution and to compile users’ comments about the final prototype. According to the participants, the main affordances of Realtime Board were:

![Figure 2: Example from Facebook.](image-url)
- To follow the progress of the project
- To find information about the problem
- To propose, sort and eliminate solutions
- To advance the project in class and at a distance
- To react to colleagues’ work.

Figure 3: Example from Realtime Board, Knowledge Forum

Knowledge Forum 6.0 (KF), a “discussion forum” tool, was used with students to share and develop their perspectives, ideas and research. The choice of KF was motivated by the presence of numerous writing aids (scaffolding, key words, feedback) as well as the quality of images for use in the joint development of ideas (“conceptual map” type structure).

The KF affordances included the construction of the discussion team and the elaboration of a common representation of the problem, users’ needs and possible solutions (see Figure 4). Using KF, participants developed a logical assessment of the problem and possible solutions. At first, the nature of the problem was not accessible; it could not be solved. KF helped participants to structure their contributions. It seemed that all participants contributed to “advance” the discussion, organizing it in such a way that it produced concrete results without falling into sterile argumentation.

Figure 4: Example from Knowledge Forum.

Discussion

Design thinking seems to “humanize environmental problems.” The problem space widens to include social aspects. The solutions emerging from design thinking are varied and often original in some way. The problem-solvers’ chosen solutions more frequently meet users’ needs and they typically differ from their initial solutions and emerge more spontaneously. The emergence of new solutions along the way may be related to creativity.

Should online collaboration tools be used during the stages of design thinking? By using Realtime Board, Knowledge Forum and Facebook in an applied design-thinking approach to problem-solving, our trials have demonstrated the following beneficial affordances:

- Visual representation of complex problems
- Analysis, processing and dynamic sharing of available information
- Management of the resolution process (consensual identification of harmful impacts and the conceptual challenge)
- Source of reflection, support and motivation to continue working from a distance
- Support for creativity, since the problem elements and solutions appear side by side on the screen and can therefore be combined to reveal new ideas (connection facilitates innovation)
- Communication: gradual building of interpersonal relationships.

The Facebook page, which was gradually expanded one post at a time, did not provide an overview of the broader problem of flooding or the sub-problem of water contamination. However, Facebook did lead to the gradual
development of information on the different aspects of a complex problem. The solutions and prototypes were built and improved in person and later on Facebook, which made it possible to put aside the problem, to think about it, then to come back with new solutions. Realtime Board allowed the participants to represent their thought process visually and to consider the various aspects of the problem, its solutions and the various prototypes on a few pages. Like Facebook, Realtime Board facilitated the progressive definition of the problem, the sharing and critiquing of possible solutions and prototypes, and the building of a problem-solving team. Realtime Board allowed participants to gather information about a problem, which was helpful because the complexity of an environmental issue makes it difficult to remember all the relevant elements. Realtime Board used fewer images than tables and conceptual networks to capture and analyse problems. Knowledge Forum enabled the development of a common representation of the problem, while serving as a discussion forum and a tool to keep track of work-in-progress. KF seemed to provide problem-solvers with a variety of options to organize their ideas.

Discussion

Our experiments demonstrate that design thinking offers multiple affordances for the pedagogical accompaniment of people in their problem-solving. In design thinking, the definition of problems leads to more analytical thought, which in turn contributes to a better description of complex problems. A large and well-organized problem-space is conducive to proposing solutions better adapted to the situation. Using ICTs in problem-solving seems promising and may depend on their nature (user-friendliness, available functions etc.).

Acknowledgments

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References


Part IX - Responsible Research for the SDGs

Engaging Students in Participatory Action-Oriented Research for Sustainability

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Abstract

Quality education (SDG 4), decent work and economic growth (SDG 8), reducing inequality (SDG 10) and sustainable cities and communities (SDG 11) are four of the many SDGs from which educators can draw to provide rich learning opportunities for graduate students. In Royal Roads University’s (RRU’s) Master of Arts in Leadership (MAL) programme, students engage with organizations to generate impactful research and meaningful effects. Organizations are foundational in cultivating regenerative and sustainable societies. The term “organization” can be broadly defined to include community groups, networks and movements as well as more conventionally understood organizations. The MAL programme is committed to enabling change through participatory, action-oriented projects and consulting that extend impact thinking and doing beyond traditional academic approaches to research. Furthermore, a strong commitment to competency-based learning that focuses on leading self, leading teams and leading organizational and community systems results in a significant co-production of engagement and connectivity with organizations outside of the academy, leading to the sustainability of the person, the intervention and the organization.

The purpose of this paper is to share lessons from RRU on:

- A participatory, action-oriented, community-engagement research project framework for graduate students
- Innovative and creative engagement and teaching strategies
- The competencies and capacity needed to educate the next generation of changemakers.

Engaging Students in Participatory Action-Oriented Research for Sustainability

Quality education (SDG 4), decent work and economic growth (SDG 8), reducing inequality (SDG 10) and sustainable cities and communities (SDG 11) are four of the many SDGs from which educators can draw to provide rich learning opportunities for graduate students. In Royal Roads University’s (RRU’s) Master of Arts in Leadership (MAL) programme, students engage with organizations to generate impactful research. Organizations are foundational in cultivating regenerative and sustainable societies. The term “organization” can be broadly defined to include community groups, networks and movements as well as more conventionally understood organizations. The MAL programme is committed to enabling change through participatory, action-oriented projects and consulting that extend impact thinking and doing beyond traditional academic approaches to research. Furthermore, a strong commitment to competency-based learning that focuses on leading self, leading teams and leading organizational and community systems results in a significant co-production of knowledge and connectivity with organizations outside of the academy. These leadership actions result in the sustainability of the person, the intervention and the organization. This paper outlines key elements of the MAL programme, including two specific community-based initiatives called (1) the Leadership Challenge and (2) the Engaged Leadership Project. It also outlines the programme’s attempt to take steps toward reconciliation with Indigenous peoples while also raising consciousness of Canada’s colonial history and working toward decolonization.
The MAL programme has been promoting meaningful, real-world impact through research and leadership for over twenty years. Since its inception, the programme has attracted mid-career professionals and given leaders in all sectors - public, private and non-profit - and at all levels of their organizations, the opportunity to hone their leadership skills, while making a difference through research. Building upon RRU’s learning, teaching and research model (LTRM: see http://ctet.royalroads.ca/learning-teaching-research-model), blended learning platform (online and face-to-face), team-teaching method, and an interdisciplinary approach to leadership, the programme faculty and staff work together as a high-functioning team to demonstrate unwavering commitment to student success. Student success is built upon bridging the gap between scholarship and practice throughout two years of coursework and, in particular, through (1) a first-year project called the “Leadership Challenge” and (2) a second-year capstone thesis or “Engaged Leadership Project”.

Leadership Challenge

First, the Leadership Challenge (LC) is a real-life challenge that a local organization is currently experiencing. Prior to the residency, faculty engage a local non-profit or sector-relevant sponsor with an organizational challenge or opportunity that would benefit from inquiry by teams of graduate students. The organizational sponsor works with the faculty to develop an LC document that outlines the organization’s mission, goals and structure and the critical details of the immediate leadership issue that they are seeking to address.

Students then self-select (or are sometimes organized) into LC teams. Each LC team has approximately 5 to 7 members. The members of each LC team work together to explore the issue and prepare a response and set of recommendations to the sponsoring organization on its leadership challenge. The students have approximately ten days from when they meet the client to deliver their recommendations to the client panel. During this ten-day period, they identify their team agreements, values and vision; determine the core client issue that they are going to focus on; determine their roles, responsibilities and tasks; and complete their exploration of the issue and their preparation of a response and recommendations. The assignment is completed during their residency and is designed to provide an immediate opportunity to apply leadership learning to a real-life situation and to navigate the delivery of the final product within the context of learning more about group process and working within a team. As Kouzes and Posner (2012) have emphasized, effective “leaders foster collaboration by building trust and facilitating relationships” (p. 20). While time is set aside daily for these tasks, LC teams discover that evening and weekend work is also required in order to complete the project. The selection of a non-profit with a live and present challenge creates a genuine desire and commitment on the part of students to add value, be helpful and apply the learning from the programme curriculum. The applied opportunity to navigate the challenge while working in teams also allows the teams to extend beyond their traditional knowledge and expertise and to develop competency in the key programme areas. For example, in a recent intensive learning experience, an Indigenous organization presented a challenge associated with the growth of their organization and their dual commitment to reconciliation and organizational sustainability. The selection of this leadership challenge was spurred by a broader reconciliation initiative that RRU has undertaken and by the passion of our associate faculty colleague to amplify Indigenous content in our programme.

The School of Leadership Studies (SOLS) at RRU has taken on the Reconciliation Call to Action (See Truth & Reconciliation Commission, 2015), which includes several calls to action for institutions of higher education. SOLS and RRU have taken several steps such as including an Indigenous Scholar in Residence in the most recent intensive learning experience, integrating Indigenous scholarship into the curriculum, scheduling a session on raising the consciousness of leadership as part of the initial intensive learning experience, adding topics on Indigenous research methodology in the second-year curriculum, and consulting a circle of wisdom keepers from local nations, called the Heron People Circle.
Capstone Projects and Theses

All students in the programme take a collaborative, action-oriented approach to their capstone project or thesis. Working in partnership with key stakeholders in their organizations or communities, students design projects that address pressing issues and have demonstrable effects in everyday organizational or community life. Students engage with people who are directly affected by the problem in working toward a solution. The engagement techniques may be well-known research methods such as interviews, focus groups and surveys, or they may take the more innovative form of a world café, social change/design thinking laboratory, interview matrix, open space technology or photovoice. Results can be presented in the form of a traditional five-chapter thesis or research report, but students can also make use of video, audio, infographics, social media or other creative media in response to the partnering organization's needs. These engaged leadership projects and theses are intended to have an impact beyond citations insofar as the research process itself begins to mobilize action and stakeholder support for change. The MA Leadership programme runs four cohorts a year with approximately 40 students per cohort. This translates annually to approximately 160 projects that create positive change within the broader communities. The ripple effect of the projects and the engaged nature of the research create
significant co-production of knowledge and they translate that knowledge into thoughtful action.

The MA Leadership programme has a long-standing and successful history of providing dynamic learning aimed at developing leaders who are scholar-practitioners. The emphasis of the programme is on integrating academic concepts and theories with applied practice within the programme’s learning community and within the organizations in which students work. It is a competency-based programme. This means that we ask for more than simply reading and remembering the theories and so-called best practices of leadership; students must also be able to integrate this knowledge into their performance and practice as a leader, both in the context of the MA Leadership learning community and in their own workplace/community. Students must demonstrate to the faculty and their peers that they are able to enact the theoretical concepts by behaving in ways that make a conscious link to the theories. While cognitive knowledge can be assessed using traditional methods such as examinations and written papers, the assessment of behavioural learning outcomes can only occur if the new behaviour is observed and reported. The faculty who teach in the programme are experienced in observing behaviour, giving feedback to and coaching individuals and teams, and assessing the behavioural learning outcomes of the Leadership competencies. In practice the competencies in each of these domains are not easily separated; they are facilitated in a holistic, integrated fashion rather than along strict course lines. In the competency-based model, the pedagogy of teamwork requires self-awareness and an understanding of a leader’s context within the system that is the team.

The competency framework for effective leadership behaviour contains competencies that are embedded across the entire programme of MA in Leadership courses. These competencies include:

- **Personal Mastery:** Demonstrates reflective practice, values and ethics alignment, and a lifelong commitment to cultivating self-awareness and personal leadership.
- **Learning, Creativity & Innovation:** Attends to one’s own learning and the learning of others while thinking critically and creatively, and generating innovative approaches to complex challenges.
- **Strategic & Collaborative Leadership:** Selects leadership approach suited to the context, while effectively communicating with and listening to multiple audiences, facilitating and engaging in teamwork and decision-making, and building authentic relationships toward shared goals.
- **Engaged Inquiry:** Integrates self-inquiry and systematic inquiry that leads to learning and evidence-based action for positive change at the personal, organizational and societal levels.
- **Systems Change:** Understands one’s own sphere of influence within a system and demonstrates comprehension and application of systems thinking and complexity theory through action toward systems change.
- **Evidence-based Scholarship:** Demonstrates the ability to critically evaluate and synthesize multiple sources of information through effective communication in academic settings.

Working together, the staff and faculty in the MA Leadership programme model a cohesive approach to their shared goal of supporting students in a unified and enduring commitment to impact, throughout their studies and beyond.
RRU’s applied research, which combines “the very best of scholarship and practice, supports organizations and communities to continuously improve by responding to the new and emerging challenges in career, workplace and community” (RRU, 2014). Moreover, since RRU encourages “research that focuses on practical solutions to current real-world issues” (RRU, 2019, p. 6), showcasing the MA Leadership approach to Engaged Leadership Projects is a clear demonstration of research that matters. We believe that it is this approach to research that can support true movement and leadership on the Sustainable Development Goals.

References


Part X – Regional Perspectives
E Pluribus Unum for SDGs: Galician Universities Working Together for Sustainable Development

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Abstract
Since 2014, the three Galician public universities (A Coruña, Santiago de Compostela and Vigo) has been working together on Global Justice and Sustainable Development through an institutional network, the Rede Galega de Cooperación Universitaria para o Desenvolvemento (RGCUD, Galician Network for University Cooperation for Development). This collaboration, supported by the Regional Government, the Xunta de Galicia, has promoted a broad range of activities including awareness-raising, training, research and teaching innovation. The focus is the Sustainable Development Goals within the universities’ third mission. After five years of active, fruitful cooperation, the board of directors of RGCUD has decided to implement a strategic plan for the next ten years (2020-2030) to propel the SDGs in an innovative way in the university communities. This contribution focuses on the history, vision and framework of RGCUD as the main facilitator of SDGs in Galician universities and presents the main outcomes of the process of strategic planning in the areas of teaching, research, institutional policies, third mission and student initiatives.

A Story of Unity, Division and Cooperation: the History of Galician Universities
Located in the northwest Iberian Peninsula, Galicia is an autonomous community and historic nationality, according to the Spanish Constitution. Currently, three public universities, the University of A Coruña, the University of Santiago de Compostela and the University of Vigo, comprise the Galician university system. This institutional configuration was set up in 1980 when the single University of Santiago de Compostela was split into three universities and seven campuses throughout the region.

The history of the university in Galicia goes back to the fifteenth century. Between 1495 and 1504, a group of men from the Council and the Church promoted the foundation of a Studium Generale in Santiago de Compostela. A few years later, Alonso de Fonseca the Third, Archbishop of Compostela, financed the building of the College of Fonseca, where a Latin stone inscription announces Gallaecia fulget (Galicia shines). For almost five centuries, the university grew and spread around Galicia. In 1990, the Regional Government (Xunta de Galicia) decided to split the ancient university. The University of A Coruña and the University of Vigo were born.

Despite the shared history, affiliations and commonalities, the three universities got used to competing for students and money and complaining about unfair treatment in an atmosphere of mistrust. Instead of unity, the universities competed with each other. Fortunately, they are now moving towards cooperation. The 2030 Agenda for Sustainable Development acts as a driver of change and a trigger of a new culture of open collaboration and trust. Indeed, this Agenda has opened a window of opportunity to work together on common goals: the seventeen SDGs. On 27 November 2019, the university rectors backed and signed a public statement about the commitment of the three Galician universities to 2030 Agenda.
Another trigger for this institutional shift was the creation in 2014 of the Rede Galega de Cooperación Universitaria para o Desenvolvemento (RGCUD, Galician Network for University Cooperation for Development). This collaboration is supported by the Regional Government. It has led to a broad range of activities (awareness-raising, training, research and teaching innovation, among others) focused on Global Justice and Sustainable Development within the universities’ third mission. After five years of active, fruitful cooperation, the board of directors of RGCUD has made the decision to implement a strategic plan for the next ten years (2020-2030) to promote the SDGs in the university communities.

A Common Framework and Vision: Poverty and Famine are not World Heritage

The RGCUD Strategic Plan (2020-2030) reflects the institutional aim of creating spaces and dynamics of collaboration between Galician universities. Furthermore, the participative process provides a unique opportunity to share a common framework for human and sustainable development. Briefly, our theory of change emphasizes that poverty and famine are not World Heritage, but World Heritage sites in Galicia can be used as inspiring images to illustrate our common vision.

Some landmarks of Galician history and culture have been named UNESCO World Heritage sites since 1972: Hercules Tower, Lugo’s Roman walls and Santiago de Compostela’s old city. A Coruña is proud of Hercules Tower, a Roman lighthouse. An old legend relates how the Greek hero Hercules arrived in A Coruña to fight with Geryon, a colossal monster who had three bodies, three heads and six arms. Hercules stole Geryon’s herd of cows and oxen. The furious monster fought with Hercules, who killed him. Hercules took the corpse and buried it, building a tower over the grave. This ancient tower is known as Hercules Tower.

Despite the progress of humankind, we have been fighting tirelessly with monsters: famine, poverty, disease, inequality, exclusion, war and authoritarian rule. Unfortunately, they are World Heritage: not something to be proud of, but part of our common human history. Like Hercules, we do our best every day to beat this kind of monster following our cosmopolitan dreams instilled in the SDGs. The SDGs represent a lighthouse for humanity where the dreams and aspirations of humanism and cosmopolitanism coalesce: a society free of barbarism, fear and war. Propelled by the 2030 Agenda, humankind is currently walking together towards fraternity, hospitality and global justice.

A few years ago, the Make Poverty History campaign underlined that we were the first generation able to eradicate poverty. We should now be the first generation to deny to poverty and famine the consideration of World Heritage, because the real, genuine World Heritage is solidarity, peace, justice and human rights.

The year 1992 was a great year for Spain: The World Expo was held in Seville and the Olympics Games in Barcelona, and a high-speed train connected Madrid and Seville. Galicia made its own contribution to this Spanish celebration: the wreck of the Aegaeon Sea oil tanker at the bottom of the Hercules Tower on 3rd December. The tanker burst into flames in the middle of a storm. This catastrophe warned us of the everlasting risks and threats to humankind’s dreams. Foul black smoke tries to blind us and to turn us away from humanity and solidarity to aggressive nationalism, inequality, apopiphobia and racism, wars, violence and climate change denial. These phenomena are the black smoke that is always ready to discourage us. That is why we need to energize our collective hopes and create discourses, practices and spaces of resistance from the universities.

Lucas Augusti (Lugo) was founded in the thirteenth century BC and was soon surrounded by impressive, well-preserved Roman walls that protected the community but also isolated it from alera. Usually, human face risks and threats by running away or fighting. Most of the time, we desperately seek shelter: a safe place to live until the dangers fade or simply pass by. Therefore, walls and fences create a feeling of security for scared humans. Nevertheless, the severity and scope of global problems due to mutual interdependency and interconnectivity make this a false sense of security. We live in times of new walls and fences, although most sensible people are suspicious about their ability to protect us from global risks.

The protection and management of global public goods like the environment, health, knowledge, culture, peace or economic stability go beyond national frontiers and require international coordination and cooperation. Thus, facing global problems is a duty of solidarity that is rooted in the local realm. At local level, we are affected by the consequences of global issues. But at the same time, this is the right space to build viable, new alternatives and to implement policies to manage the World Heritage represented by global public goods.

However, endless physical, mental and moral fences are rebuilt every day by politicians, social networks and the mass media. Most of the time, discourses legitimate the
normalization of other people’s suffering. Living every day with images of humanitarian emergencies could explain the tragic indifference of people who live their lives as usual. The indifference and apathy of societies that benefit from global inequalities turn them into unsupportive, cynical communities that are incapable of worrying about other people’s welfare or creating a better world.

Despite these notes of pessimism and disenchantment, humans can also cooperate and build collective projects far from national borders. The 2030 Agenda for Sustainable Development is an outstanding example of this virtue: it sets global goals, outlines a shared future of welfare for people and communities and engages in caring for life. Our common present and future compel us to define a finishing line and a target for our journey, which has the same power of attraction as Santiago de Compostela has had over the centuries. This city has attracted myriad people and institutions who have come as pilgrims from all around the Globe using the routes of the Camino de Santiago.

There is one destination, but many ways to get there. The many routes in the Camino de Santiago de Compostela reflect the common but differentiated responsibilities of the 2030 Agenda. Everybody walks with different motivations, interests and dreams. But all the paths share the vision of the Agenda. Therefore, the diversity and proliferation of routes in the Camino de Santiago are an accurate metaphor for the innovation and plurality required to achieve the SDGs. So we can imagine Santiago de Compostela as the SDGs and the many paths to Santiago as the alternatives that humans come up with for life to flourish with others and for others, in fair institutions within a healthy and sustainable environment. The 2030 Agenda inspires new ways of walking together, leaving nobody behind.

Furthermore, over the centuries, pilgrims developed a nice tradition: to bring with them stones of different sizes. After walking for some miles, they put the stones beside the path to create a kind of artificial hills called Milladoiro. Another image of the collective action required to achieve SDGs is that it is spontaneous, bottom-up, voluntary and discretionary, but also continuously made as a tradition. As a corrective to its instability and unplanned nature, the 2030 Agenda defines a framework of coordination and the horizon of expectations and efforts required to adapt SDGs to the specific circumstances of every actor, stakeholder, person and territory. This is a voluntary duty that appeals to our best virtues as human beings: cooperation, compassion and justice to cultivate humanity. In our case, the aim is to cultivate humanity from our universities.

A Significant Landmark in the History of Cooperation between Galician Universities: the RGCUD Strategic Plan (2020-2030)

The common vision and values of the 2030 Agenda has inspired and motivated the work of RGCUD since its foundation in 2014. Two years ago, Galician Universities started to cooperate to co-create a strategic framework for RGCUD through a participatory process. This strategy, which draws on results-based management, aims to promote sustainable, positive changes in our university communities. Most of the outcomes and actions are shared with other universities’ SDG strategies and frameworks. However, two features of the Strategic Plan should be highlighted.

Firstly, Galician universities are sharing a single framework for action in the field of cooperation for development for the first time, with prioritization of five strategic areas:

1. Contribute to ensuring inclusive, equitable quality education and promote lifelong learning opportunities for all.
2. Propel the generation and transfer of knowledge through research, development and innovation activities that create solutions for the problems and challenges of sustainable human development in the five spheres of the 2030 Agenda (people, planet, prosperity, peace and partnerships).
3. Promote the development capacity of higher education institutions, research centres and public administrations in developing countries.
4. Incentivise partnerships and networking with development actors in the fields of university cooperation for development, the 2030 Agenda and the SDGs.
5. Educate global citizens who are committed to social transformation, human rights, volunteering, solidarity, a culture of peace and sustainable human development.

Secondly, the Strategic Plan aspires to reinforce the contribution of Galician universities to the 2030 Agenda by determining five management outcomes designed to obtain a positive impact in our institutions and university communities:

1. Galician public universities incorporate the principles, values and objectives of sustainable human development into their governance, planning and management.
2. Galician public universities integrate into the education of the university community competencies and subjects related to equitable, inclusive and sustainable development that are required to develop active, critical global citizenship, committed to positive social change.

3. Galician public universities promote the generation and transfer of knowledge in the field of sustainable development including the vision and challenges of the 2030 Agenda in all its spheres (people, prosperity, planet, peace and partnerships).

4. RGCUD strengthens its institutional capacity.

5. The Galician university community and citizens can access quality information on collective achievements in the field of university cooperation for development and on the implementation of the SDGs by Galician public universities.

In summary, this new strategy emphasises the commitment of Galician universities to the 2030 Agenda and SDGs and inspires the RGCUD mission, which is focused on promoting both international cooperation for human and sustainable development and education for global citizenship, through a broad array of activities (including teaching, research, knowledge transfer, social responsibility and leadership) with the support and participation of the entire university community. This is our mission and we joined forces with others to enable an institutional environment that is sensitive to sustainable development, to think big and change the world.

Conclusion
This article briefly outlines the history, vision and motivations of RGCUD as the main facilitator of SDGs in Galician universities. Furthermore, we presented the main outcomes of the process of strategic planning in the areas of teaching, research, institutional policies, third mission and student initiatives. The Strategic Plan (2020-2030) underlines Galician universities’ readiness to deliver SDGs. Currently, it only represents a possibility. Our dream is to get it done. Our common future is the future of the young people we teach and educate with love and affection, of the communities we are committed to and of all humankind. The universities of A Coruña, Santiago de Compostela and Vigo share a common duty: to help to create a healthy planet and a fair society in which to live in sustainable communities with flourishing lives.

References


In the five years since the adoption of Agenda 2030 for Sustainable Development, it is beyond dispute that universities all over the world have stepped up to help in tackling the major global challenges that it raises. However, it is also clear that progress towards achieving the Sustainable Development Goals (SDGs) has so far been extremely slow, and in some aspects as important as social inequality and the climate emergency, we are suffering setbacks rather than making progress.\(^1\)

Universities have a key role to play in the construction of Agenda 2030 for several reasons. The first is that academic knowledge is fundamental to addressing the SDGs: sharing the knowledge generated or expanded in universities with other stakeholders is essential to arriving at solutions to the challenges posed by Agenda 2030. The second is that a global political agenda of this scope is, for the first time, championing the need for equal access to higher education for all. This demonstrates a worldwide acknowledgement that the passage through university helps to craft global citizens.

Nonetheless, it is clear that universities are only one of many stakeholders within the new framework for action established by Agenda 2030. Universities alone cannot attain the SDGs, nor can other stakeholders or sectors in isolation. That said, universities can and must respond to the call of the social contract outlined in Agenda 2030 and make headway in this direction, both at the individual university level and within broader university systems.

The twelve universities that make up the Catalan university system have organized to achieve this objective. Over forty years of groundwork have been laid by the Government of Catalonia and the Catalan university system’s coordinating body, the Inter-University Council of Catalonia (in Catalan, CIC). Based on these efforts, the Catalan universities set up a working group in 2019 to develop an action plan to speed up implementation of Agenda 2030 in the institutions and other organizations that make up the Catalan university system.

This system-wide step is significant and one of only a few examples of coordinated action to implement Agenda 2030 by a regional university system. However, it did not come out of nowhere. In 2017, the eight universities in the Catalan Association of Public Universities (ACUP) published their position on Agenda 2030 in a document entitled “The commitment of Catalan universities to the Sustainable Development Goals: Towards a transformative education for a new world”.\(^2\) A year later, the Spanish universities that belong to the Conference of Rectors of Spanish Universities (CRUE) also stated their public commitment to Agenda 2030\(^3\) and laid out seven specific lines of action to put the agenda into practice.

However, Catalan universities have done more over the period than simply sign up to commitments. They have also been implementing their commitments through specific actions. Three important examples of how collaborative work enables significant structural change are described below. Particularly noteworthy is the collaboration between the Catalan universities and the Catalan University Quality Assurance Agency (AQU Catalunya), which led to the adoption in 2018 of a general framework for incorporating a gender perspective into higher education.\(^4\) After a number of years, this collaborative project has finally taken concrete shape in

2. See http://www.acup.cat/es/publicaciones/declaracio-el-compromis-de-
exi-universitats-catalanes-amb-agenda-2030.
3. See http://www.universities.gob.es/Portal/es/SalaDePrensa/Multimedia/
   Publicaciones/Documentos/CRIU%20Universidades%20de%20Espa%cc%81a%20-%20Posicionamiento.pdf.
a guide that targets fulfillment of SDG 5 on gender equality and will be rolled out from the academic year 2020-2021. Also in 2018, Catalan universities, research centres and science parks, through the University Services Consortium of Catalonia (CSUC), pledged to jointly purchase totally renewable energy for their campuses and facilities. This action contributes to the fulfillment of SDG 7 on accessible, non-polluting energy for all, while also enabling the Catalan university system to move towards closing the gap between commitment and action. Finally, in 2019, a working group led by the Government of Catalonia’s Department of Universities and Research was set up to develop a Catalan open science strategy, a consensus undertaking that is also part of the National Pact for the Knowledge Society5 recently adopted by the Government.

Such ongoing collaboration has also led to the creation of the previously mentioned working group for Agenda 2030 within the framework of the CIC. The group, which is backed by the Government of Catalonia and the twelve Catalan universities, has invited participation from the other members of the university system mentioned earlier: AQU Catalunya and ACUP, as well as the Catalan Agency for Management of University and Research Grants (AGAUR), the CERCA Institute of Catalan Research Centres and, obviously, the entire community of university students.

As previously noted, the goal of the working group is to produce an action plan to speed up the implementation of Agenda 2030 in the Catalan university system. With the aim of completing the mission by the end of 2020, the first step has been to assess the current state of the system. A key input in the assessment has come from the results of the 2nd Global Survey Report on Higher Education and Research for Sustainable Development6, produced by the International Association of Universities (IAU) in 2019. The survey results show clearly that the situation in the Catalan universities is very similar to other European universities. There is extensive knowledge of Agenda 2030 among university administrators and extensive coverage of all SDGs in teaching, research and management. The majority of Catalan universities have already or are now engaged in producing a specific strategy with respect to Agenda 2030. However, three obstacles stand in the way of implementing Agenda 2030 in the Catalan institutions: a lack of staff focusing on sustainable development, a lack of funding to implement actions, and a lack of specific training for academic and administrative staff.

Universities will need to embrace profound systemic change to address these shortcomings and carry out the actions needed to expedite the incorporation of the principles of Agenda 2030. Only by all of us working together, and that includes our universities, can we make progress and contribute to tackling the major global and local challenges that we face. This is the commitment of the Catalan university system.

On 6 March 2020, we were at the Pompeu Fabra University (UPF) to share, with attendees of the second international conference on SDGs: 2nd GUNi International Conference on SDGs: Higher Education & Science Take Action. Summary Report, perspectives of Catalan work in this area. Only seven days later, the Spanish government ordered a lockdown to prevent COVID19 contagion in the pandemic. This is a global crisis that is putting humanity in an extremely difficult position. All the commitments to the sustainable development of planet Earth made by governments worldwide have become urgent, even more than before, if this is possible. There is no time left, we cannot wait any longer. We said this on the conference day: we are going too slowly. Coronavirus has revealed the ignominy of our economic and social model and the many hidden, silenced vulnerabilities that have been exposed in all their harshness. It has also brought to the fore the flagrant inequalities that a “simple” virus has revealed with total virulence.

How can we really bring about change? We start with the Government of Catalonia’s commitment to the Sustainable Development Goals, which is described in the National plan for the implementation of Agenda 2030 in Catalonia. The strategy involves all government departments and is coordinated by the Advisory Council for the Sustainable Development of Catalonia. Inevitably, the plan has two main areas: internal, with commitments to be achieved within Catalonia; and external, with Catalonia’s commitments to the international community. Now, more than ever, it is vital for all society to participate to create a new, shared mental framework so that the most urgent transformations can be made quickly without too much resistance. Now we know that we can make dramatic changes if our life depends on it. This will still be the case once the pandemic is over: our lives are threatened by the climate emergency.

In the conversation on 6 March, we suggested that in the development area there is a need to make knowledge more interdisciplinary, share expertise and work with community participation to have an impact, increase sustainability and ensure the accountability of all actions. One of the issues that came up in the session was the need for a feminist approach, with a global and local agenda based on everyday life. Again, the pandemic has reinforced this view: where have solutions needed to come from? From care, from the body, as the point from which to start to act, as the philosopher Marina García stated some time ago in her reflections.

From the perspective of Catalan cooperation, it is imperative, increasingly relevant and appropriate to take a 360 degree view of the project in which the region is involved. For this reason, the participative process that has been carried out, called Vision 2030, was designed to go beyond a discussion among the world of cooperation and its entities, and start to open up a range of opportunities for joint intervention with the rest of the actors in our society. There is no other way: we must focus not on the 0.7% allocated for cooperation, but the remaining 99.3% of our governments’ budgets. Only policy coherence and a true global/local vision will bring about the necessary changes. To go back to coronavirus, its arrival has underscored this vision, which is not always shared by all sectors of society. We need all our knowledge and expertise to resolve this crisis, but not separately. Instead, we must work together to address the challenges of the twenty-first century. In numerous ways,
preconceived scales of social values have been totally altered. For example, technology has been combined with health through the world of makers, who have produced ventilators and masks; communities have supported the most vulnerable, creating networks to provide neighborhood support; carers of all kinds have carried out a vital task, not only health workers but also cleaners and supermarket shelf-stockers; and the importance of a suitable structure that enables local food production and distribution has been highlighted. In fact, the most basic, often underappreciated infrastructures have been moved to the top of what we should consider important. We must take care of, maintain and defend these infrastructures in the public arena: health, education, mobility, food and housing, among others.

As stated by the philosopher Divya Dwivedi, the pandemic has shown that the processes that have organised our life are distributed around the world, but some of their components have reached their functional limit. It has been revealed that the least favoured, the poorest, cannot access hospitals or isolate in suitable conditions without dying of hunger. So we have to change processes that do not function to achieve better distribution of well-being worldwide.

The question is, how can we move from commitment to action to obtain a more sustainable, fairer world? In the area of cooperation, we are clearly progressing by setting priorities, with the approval by the Catalan government and the Parliament of Catalonia of the Master Plan for Development Cooperation 2019-2022. We are reinforcing our defining elements to make a real contribution and impact and bring about the transformation that the situation requires. The plan defines a set of priorities for development and education projects for critical citizenship. They have been translated into seven strategic objectives aligned with the SDGs and the gender approach and based on human rights. These objectives must be the basis of all public policies, particularly those associated with the area of development. In this way, we will achieve policy coherence, which must be associated with solidarity, sustainability, the search for justice and peace.

The plan establishes the need to expand and improve collaboration with universities and research using tools such as service-learning, which can open up a wide range of opportunities and new approaches.

However, it is vital to start with some fundamental aspects that I would like to stress. First, we need a lot more adaptability and flexibility. The world was already in rapid transformation, but the pandemic has accelerated this. We need to take advantage of this inflection point so that we do not return to outdated models. Institutions, organisations, companies, universities and all society must transform itself radically and embrace the uncertainty and the transformation “in progress”. We are experiencing and seeking processes rather than definitive solutions. We need a great capacity to update our skills continuously and accept that there are few certainties.

Another way to prepare for the post-pandemic world is through the real expansion of skills and capacity to access technology. Technologies such as artificial intelligence, big data, the internet of things, virtual and augmented reality and robotics will change our reality dramatically. We must also fight to ensure that this change is achieved with respect for human rights and universal access for the entire world population, so that it does not become another way to increase inequalities between rich and poor. In this area, interesting proposals were made in the seminar organised a few weeks ago by the Catalan Agency for Development Cooperation and the entity Novact.

Undoubtedly, another indispensable tool will be creativity and innovation. We are seeing this in the exceptional situation that the pandemic has created. Companies, entities, neighbourhoods and communities have come up with responses to the challenges of lockdown and the health emergency, as well as social, food and economic challenges. In the post-pandemic world, we must take the utmost advantage of human ingenuity. Human creativity will be essential, as long as it is focused on achieving the common good. We must focus much more on lifelong learning and value knowledge that is often dismissed or overlooked. Community knowledge, the construction of knowledge based on a range of skills, has been found to be highly valuable. The Global Economic Forum’s forecast about essential skills for the near future should be considered an opportunity. The Forum predicts that in just five years, 35% of the skills that are considered vital today will change. We must ensure that everyone can access the new skills, and nobody is left behind.

3. https://twitter.com/i/status/1263277076422864898
However, creativity must be accompanied by critical thinking, to ensure that citizens are aware and well-informed, appraise each of their actions and are aware of the consequences that are involved. Therefore, we focus particularly on generating critical citizenry, who make decisions with knowledge and solidarity. Both the review that we are starting in education for development and the strengthening of the Catalan programme to protect human rights defenders will be of great importance to generate the public opinion required to bring about the systemic changes needed in the current emergency situation in climate and health.

The other fundamental area to reinforce is the search for new partnerships. The strong desire for multi-level, multi-actor partnerships, which is part of our DNA, is being implemented with actions that have an impact on areas relating to the climate emergency, resilience, food sovereignty and environmental justice. It is increasingly evident that we must support processes that emerge directly from the communities with which we work. That is why 2020 should be a year of consolidation. For example, we should consolidate our contribution to the Women’s Funds of Mozambique, Senegal and Morocco and support base movements and associations, which are those that must transform the territories in the end.

We have started out by assessing the Catalan cooperation sector’s capacity to generate synergies associated with sustainability, the environment and climate change. Based on this document, we are beginning to detect opportunities for joint work that take advantage of the knowledge, expertise and actions of the various Catalan government bodies and environmental associations, the NGOs, the universities and the research centres. We form alliances to act together locally and globally, and to implement initiatives that promote real changes in the consumption habits and system that clearly damage our environment7.

At the Catalan Agency for Development Cooperation, we want to continue to be relevant with the final objective of improving the world and eliminating inequalities by transforming the structures that cause them. To achieve this objective, which is sometimes overwhelming, we must keep up-to-date constantly. The sudden systemic disruption caused by the emergence of the COVID19 pandemic has made this objective even firmer. Beyond the new framework provided by the approval of the Master plan for development cooperation 2019-2022, we must ensure that the Catalan Agency for Development Cooperation takes the maximum advantage of its expertise and added value for the sustainable development of the planet, in this situation in which we must react rapidly and consistently with the consequences of coronavirus. We aim to be a tool for connection, a facilitator that generates opportunities and links between development organisations and stakeholders. In the twenty-first century in a post-pandemic scenario, this requires the maximum interdisciplinarity and incorporation of everyone.

In the words of the philosopher Gilles Deleuze: thinking is creating, creating is resisting.

Part XI – Students’ Voices
Part XI – Students’ voices

The Relationship between Higher Education Institutions and the UN’s SDGs

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Due to growing concerns over social inequalities, global warming and the need to improve living conditions, all United Nations member states adopted 17 Sustainable Development Goals in 2015. These goals were a response to a universal and ambitious sustainable development agenda involving education, health, the environment, industry, justice and governance, among others, to ensure prosperity for people and safeguard the planet.

The role of universities at both global and local levels is crucial to responding to health and demographic change, food security, quality education for all, safe clean water, green and efficient energy sources, climate change, and inclusive and secure communities. They also work as an essential tool to help in the economic, social and cultural development of their nation, region or society. In the past few decades, people have shown a heightened awareness of the topic of climate change and all of its causes and consequences because they have started to realize how important the topic is and how crucial sustainability is to saving our planet. Consequently, there has also been a significant rise in the number of students interested in the topic, putting pressure on educational institutions. As a result, universities from around the world have started implementing measures to respect and follow the 17 Sustainable Development Goals adopted by UN member states in 2015. For example, more universities now offer vegan options on their menu, use less plastic in their activities or implement sustainability subjects in their academic programmes. University rankings are commonly seen as a measure of prestige and integrity and as a mark of higher education quality (which is a sum of a compendium of features and indicators). Now, because of the world’s shifting circumstances and all the implications that this entails for the measuring indicators noted above, public opinion is calling to include the way in which universities are committed to environmental issues as another filter to

Arab Region

Regarding Arab countries, there have been a number of past strategies over the years that have lacked a complete and inclusive approach to development. However, the 2030 Agenda and its essential goals, which embrace the economic, social and environmental perspectives of sustainable development, provide a promising opportunity for the well-being of the world’s future generations and the planet.

In particular, universities are essential to achieving the SDGs because they can equip the next generation with the skills, knowledge and understanding required to address sustainability challenges and opportunities and conduct research that advances the sustainable development agenda. They can also set an example and use their expertise, capabilities and leadership to influence stakeholders to adopt and model more sustainable practices. For this to work, however, universities should be fully committed to supporting and implementing the 2030 Agenda for Sustainable Development.

In relation to universities in the Arab region and the importance of Higher Education Institutions in achieving the SDGs, the Egyptian Sustainable Development Forum (ESDF) has successfully worked to establish strong partnerships with 18 Egyptian universities over the past few years in order to help them to become more sustainable and work together to follow the goals and measures implemented in the SDGs. Some of the measures instituted by the ESDF include educating participants on biodiversity, holding international conventions, discussing the role of young people at the Convention on Biological Diversity Conference of the Parties (COP 14) and encouraging students to undertake different activities all over Egypt. This has resulted in the participation of over 320 young people from different
universities in the international event, which was attended by approximately 9,000 participants from 196 countries. 

Education, which has a long history as an international priority, is essential to achieving all the SDGs. Indeed, the right to education was first specified in the Universal Declaration of Human Rights in 1948, so it makes sense that it became the fourth of the seventeen SDGs.

Southeast Africa

In Southeast Africa, the University of Malawi (UNIMA) has significant experience in scaling up early childhood development and quality education. In 2003, the Department of Human Ecology at Chancellor College, which is part of UNIMA, established a community-based childcare centre in the Zomba district, one of the country’s poorest communities, to improve the care and early learning experiences of children aged 2 to 6 years. However, the centre also contributed to improving nutrition, health and sanitation, which relate to two other SDGs.

In addition, UNIMA participated in the Lake Chilwa Basin Climate Change Adaptation Programme, which, among other initiatives, helped women to grow their own gardens. By doing this, the women no longer needed to rely on their household food supplies to feed their children or livestock. They were also taught about climate-smart agriculture approaches that could be applied on their homestead.

The same programme provided seedlings to a school so that it could gain its own reliable source of energy, and a biogas digester was built to try using biogas as a form of clean energy. After the improvements, more parents enrolled their children and the enrolment numbers leapt from 10 to 300.

UNIMA was also a member of MESA (Mainstreaming Environment and Sustainability in African Universities), an initiative coordinated by UNEP, UNESCO and the Association of African Universities, which involved new ways of thinking about teaching, research and community engagement. Moreover, in 2013, UNIMA organized a follow-up course along with other local universities and staff in Zimbabwe and South Africa. The course was run by the University of Agder in Norway and provided skills to transform the pedagogy used in education for sustainable development, focusing on climate change adaptation and mitigation.

As we have seen, implementation of the SDGs usually goes beyond interfaculty collaboration within a single university to encompassing several universities. Educational institutions need to cooperate to make better, faster progress with initiatives of this kind. So far, education has played a fundamental role at all levels, from primary school to universities. Higher Education Institutions are powerful tools to push society forward by implementing new ways to teach and educate sustainably and conscientiously.

Latin America

In June 2018, a conference was held in Córdoba, Argentina to draw up an action plan and establish priorities and conditions for Latin America to engage with the SDGs, specifically to accomplish the targets set out in SDG 4, “Quality Education”. The conference established that education is a human right and a public good, never a commodity. However, the continent has faced problems that do not allow it to keep pace with the SDGs, and improved quality of life, sustainability and education have not been priorities in the region, given the economic and financial nature of the region’s countries. Unless there is a radical change in the region’s governments, poverty and inequality will remain as they are or become worse.

In order for Latin American universities to tackle the SDGs, they need more autonomy from governments and government policies, and they need to change the curricula and promote socially oriented research, among other things. These changes are needed to attract other stakeholders and help Higher Education Institutions to achieve the goals proposed by the United Nations. Furthermore, many governments in the region cannot see the link between the educational SDGs and the other SDGs.
In many countries in Latin America, education is viewed as a product and students as consumers. Without doubt, this attitude automatically excludes the majority from gaining access to education. Commercialisation seeks only to gain economic profits, rather than prepare students who can contribute to the development of society. Almost half of all universities that offer higher education in the region (48.2%) are in the private sector.

The impetus to change the scope of education, to broaden education and to remake the educational structure comes mainly from students. Their aim is not only to allow everyone to get to an education, but also to look farther and reform the entire educational landscape to integrate the SDGs into curricula and create awareness of how to focus more effectively on the SDGs in every degree, master’s programme, specialization, doctorate and research project.

Conclusions
For all the above reasons, it is clear that student concerns over the approaches of universities to environmental, equality or educational issues is what leads Higher Educational Institutions to feel pressure and become willing to change. Students’ preoccupations change and evolve over the years, and so must universities. For instance, we have seen first-hand the “Menú por el planeta” project, an initiative arising from student concerns over the climate crisis and animal rights; Pompeu Fabra University is the first to implement a vegan menu in its cafeterias.

Higher Education Institutions have a duty to train students responsibly and provide a future-oriented education in a world that is calling out for change. The SDGs have to be addressed by all governments but they have to be transmitted to society, especially to young people, who tend to fight harder for the future. Ultimately, universities will be incredibly powerful tools that students can use to start shaping who they want to be and what they want to do. If Higher Education Institutions implement sustainable development in their courses, they will be contributing directly to how and what people will be fighting for in the future; a future that needs saving.

References
The Role of Higher Education and Universities in Society: Adopting the SDGs

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The Global University Network for Innovation (GUNi) is an international network that was created in 1999. It is supported by UNESCO and the Catalan Association of Public Universities (ACUP), which hosts its secretariat and presidency.

Higher education institutions, as well as the societies in which they operate, are in the midst of a global transformation in all contexts, albeit with specific features in certain parts of the world. The role of higher education institutions in society will shape the place of knowledge in tackling the challenges the world faces today. It will also have an impact on the influence and opportunities of higher education institutions to contribute to building a better world. Higher education is challenged to create and spread socially significant knowledge and to do so in advance to play a proactive, involved role in the transformation and positive change of societies. Consequently, we must reconsider what the social contribution of higher education should be. GUNi encourages higher education institutions to reassess their role, embrace this process of transformation and empower their critical position within society.

The Sustainable Development Goals, also known as the Global Goals, were adopted by all UN Member States in 2015 as a universal call to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. There are a total of 17 SDGs with 169 integrated targets to recognize that interventions in one area affect the outcomes of others and that development must balance environmental, economic and social sustainability. The new agenda, which builds on the Millennium Development Goals, is designed to be relevant to all countries and focuses on improving equity to meet the needs of women, children and the poorest, most disadvantaged people. That is why the SDGs have been drawn up to bring the world several life-changing zeros: zero poverty, zero hunger, zero AIDS and zero discrimination against women and girls. Everyone is needed to achieve these ambitious goals. It takes the creativity, knowledge, technology and financial resources of all society to attain the SDGs in every context.

SDG4 is the main goal that is fully focused on the educational field. Higher education is outlined in target 4.3 of SDG4 which strives to "By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university." The advance in education also entails development in other significant areas of goals related to poverty (SDG1), health and wellbeing (SDG3), gender equality (SDG5), decent work and economic growth (SDG8), responsible consumption and production (SDG12), climate change (SDG13), and peace, justice and strong institutions (SDG16).

The blueprint for SDG4, the Education 2030 Framework for Action (FFA), has two political pillars that specifically emphasize the monitoring and improvement of learning outcomes of others and that development must balance environmental, economic and social sustainability. The new agenda, which builds on the


2. The United Nations Millennium Development Goals (MDGs) were eight goals that all 189 UN Member States agreed to try to achieve by 2015. The United Nations Millennium Declaration, signed in September 2000, committed world leaders to combat poverty, hunger, illiteracy, environmental degradation and discrimination against women. The MDGs were derived from the Declaration and had specific targets and indicators. The MDGs have been superseded by the Sustainable Development Goals (World Health Organization, n.d.)

outcomes and those who are excluded. The Framework implies that headway has been made on existing international agreements in favour of upper education and acknowledges that a well-established, well-regulated tertiary education system will improve access, equity, quality and connectedness. It may scale back the dissonance between what is taught and what must be learned to make sure technology, open educational resources and distance education are properly developed and implemented.

Target 4.3 is officially managed by the UNESCO Institute for Statistics through the indicator “gross enrolment ratio for tertiary education”. Meanwhile, UNESCO is reinforcing plans for implementing, coordinating, financing and reviewing the 2030 education agenda globally, regionally and nationally to ensure parity for all in terms of educational opportunities. These measures can be carried out due to cooperation with donors, Member States and stakeholders to address quality enhancement, internationalization and digital education.

The role of higher education and universities in society is to adopt the Sustainable Development Goals. According to the International Association of Universities, universities should work in areas such as undertaking responsible research, the education and teaching of citizens and future leaders, fostering community engagement and solidarity, developing strategic partnerships with civil society, the private sector, local authorities, decision-makers and other universities and higher education institutions.

Some of the initiatives promoted to introduce SDGs in universities and higher education systems address global and local levels. For instance, the Higher Education Sustainability Initiative (HESI) is at global level. It consists of a partnership between UNESCO, UNEP, the United Nations Department of Economic and Social Affairs and other international institutions that can have a great impact. This initiative emerged in 2012 in the run-up to the United Nations Conference on Sustainable Development (Rio+20). HESI accounted for more than one-third of all the voluntary commitments that were launched at Rio+20 with commitments from over 300 universities from around the world. Higher education institutions can join the network freely and those that take part in the initiative commit to promoting green campuses, supporting local sustainability efforts, teaching sustainable development across all disciplines of study and stimulating research on sustainable development knowledge, among other factors.

Notwithstanding, some initiatives have emerged at regional and local level. In the Manne Education Centre in Malmö (Sweden), for example, one initiative was designed to raise awareness of SDG 14 (Life below water). Agneta Rehn and Kerstein Sonesson developed a programme called The Sea, SDGs and Me. Save the Sea from Plastic. The objectives were to introduce Swedish science teacher trainees and international students to the SDGs and ocean literacy, to involve teacher trainees in development work and the assessment of a new programme at an education centre, and to evaluate the experience and reflections. Altogether, students in 18 classes from grades 2-9 and their teachers participated in the new programme during the autumn semester 2018 and answered a questionnaire on completion. The programme consisted of outdoor activities, lessons with hands-on activities at the centre, a challenge-based group activity (to answer the question “How can we save the sea from plastic?”), and student presentations and solutions. The results showed that the teacher trainees appreciated participating in the programme and being involved in a “real case” of development and evaluation. They learnt about the SDGs and ocean literacy, and reflected on the benefits of bringing a group of students outside the classroom and the importance of combining theoretical issues and practical activities at local level to raise awareness of global challenges and the SDGs.

Even though there has been significant progress in developing and broadening educational opportunities over the past 15 years, the Education for All (EFA) goals and education-related MDGs have not been attained yet. Education that should be in place in 2030 needs to focus on these goals, while current and future global and national education challenges are addressed.

To conclude, to implement the Sustainable Development Goals in higher education systems, the most important thing is to raise awareness among young people, as they have the potential to change the world. Moreover, money should be invested in initiatives globally, but it is also important to promote education locally to raise people’s awareness. Cooperation among educational institutions is vital and universities should promote non-competition.

The times are changing. They are changing because of the dizzying revolution in which humankind is now immersed, a revolution that has led to the most interconnected world in human history, thanks to rapid, massive technological development that has become synonymous with progress. However, this new scenario calls for measures to be taken. To date, the growth and exploitation of this new situation have been pursued with no, or only very soft, responsibilities. The tech revolution has awakened the most savage face of capitalism, and society is being constantly reshaped by the demands of the market. Money and profit are the main goals on the minds of the elites who run the world. Policymaking is pursued with this mindset, while pushing other relevant and essential topics to the margins of the political agenda, such as environment issues and living conditions.

Measures are also needed because, while it is true that humankind is evolving and it may generally seem as though our lives are improving, some territories (in the broadest sense of populations, economies, cultures, etc.) are being left behind, because they have not been able to keep pace with the new technological era being imposed around the world. Now, as our contemporaries write a new chapter in history, some people may not figure among the authors. However, the real point here is that this continuous exploitation of goods and people is leading to a point of no return. Revolution is synonymous with change and any change poses challenges for those who take it up. In the current situation, the problem is that these adjustments have not been a priority for society and, as noted before, we stand at a turning point, which calls for measures that should have been introduced decades ago.

For this reason, the UN has identified and classified the goals that need to be fulfilled by 2030 in order to reverse the situation. The UN agenda is based on seventeen topics, which have been christened the Sustainable Development Goals (SDGs). The aim of the SDGs is to achieve a sustainable future for the whole planet, ensuring development in all senses (industrial, economic, social, cultural and environmental). They are an answer to the requirements of a globalized society, seeking to promote a reshaping of the current system.

The SDGs were introduced in 2015. Since then, states have striven to adopt policies to achieve the 169 SDG targets. To bring about real change, however, the SDGs must not only be on the highest political agenda, but also become part of people’s daily routines. Only if this transition occurs will the SDGs mark the beginning of something. In light of the situation, universities stand out as one of the most useful tools for the spread of the SDGs. Education is a weapon of mass construction (Josep Guardiola, 2010), so the SDGs must be applied in this sphere because ultimately universities are the factories of the future leaders of the world. It must be understood that the SDGs are not simply a plan that calls for specific political decisions. They are a final warning, a last chance to counteract the international situation that we have created. Implementing the SDGs in educational programmes will add a new perspective based on the universal values of equality, sustainability and development. This perspective has not hitherto been the primary one. If the objective is reached, however, the next generations will act in accordance with these values not only in their professional careers, but also in their personal lives. A new set of values will gradually take root in society, with the SDGs exerting a dual influence on the institutional approach and the popular one. Ultimately, their failure or success will hinge on this key point. Lastly, it is important to stress that the SDGs must not only be introduced in a theoretical way, but also be supported by practice and evidence. In every respect, universities need to behave in accordance with the seventeen SDGs. This includes taking small measures in the daily lives of university campuses in support of the
values championed by the SDGs. It means making no accommodation for companies that exploit or take advantage of others; it means becoming a benchmark in terms of actions, because actions are part of the educational process too. We are running out of time, and radicalism must not frighten our centres of knowledge. We need radicalism to accomplish the triple mission that is the duty of all universities: radicalism in teaching, radicalism in research and radicalism in changing the way that students are educated. Universities have an obligation to tackle these issues by going to the root of the problem, because this is the only way that we can have some kind of choice over the fate of the Earth. However, universities cannot be the tool that society seeks if they remain as they are. The Sustainable Development Goals imply disruption. Achieving the SDGs will require breaking with the status quo. We cannot expect success if universities continue using the same techniques for teaching classes that they used 25 years ago. Years have passed, society has developed and so have our needs. Now we need students who are able not only to memorize information, but also to be critical and put words into action. The professionals-to-be are the key to spreading change and actually meeting the SDGs.

There is an additional point that makes it very difficult for Higher Education Institutions to be trailblazers in the achievement of the SDGs. Most of them have started to create initiatives that encourage sustainable habits, such as menu changes in the campus cafeteria or reductions in the use of plastics. However, it is impossible for them to achieve sustainability if they keep relying on industries that do not support disruption or the change that universities purportedly seek. For example, Pompeu Fabra University (in Catalan, UPF) in Barcelona has recently joined the MenúPlaneta initiative, which consists in offering a whole meat-free lunch menu suitable for vegetarians. This has been viewed as a very positive change in habits since it can bring about a reduction in the consumption of meat and also, as has been seen in other institutions such as the University of Cambridge, a reduction in CO2 emissions per kilogram of food. In addition, the cafeteria no longer offers plastic water bottles (they are now made of glass) and there are drinking fountains all over campus to promote the usage of reusable water bottles. However, the UPF still hosts businesses on its well-known careers website UPFama such as Inditex, which has exploited workers in Bangladesh and fails to comply with SDG 8: Decent work and economic growth.

It is also important to note that the SDGs are due in 2030 for a reason. Short-term plans can help to make progress toward the final goal, but they are not the real solution. “In the age of the permanent campaign, politicians plan only as far as their next bid for election”, note Jo Guldi and David Armitage in their book The History Manifesto. This statement expresses the reality of our current situation, which requires a better understanding of the facts. In order to achieve any Sustainable Development Goal, long-termism is the key. We do not have a great deal of time, because climate change is on the rise and it is very unpredictable. However, we do have enough time to plan solutions that will actually make a difference as the years go by. The real challenge is to devise a solution that will not merely be a Band-Aid which holds for a few months, but that will make the problem go away once and for all.

To conclude, it is important to underscore that Higher Education Institutions are crucial to create disruption, change the status quo and achieve the SDGs. They will be key if they can radically change themselves and remake themselves into what is being asked of them, namely to set an example. The starting point must be to create competent professionals by giving them the ability to transform the global landscape and integrate the Sustainable Development Goals into the lives of everyone.

References
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Mónica Figueras has a PhD in Journalism and holds a degree in Information Sciences and Sociology from the Universitat Autònoma de Barcelona (UAB). She is a full-time professor in the Department of Communication at Universitat Pompeu Fabra (UPF). Her lines of research are youth and communication, media education and journalistic deontology, with special interest in the gender perspective. Since 2013, she has been vice-chancellor at the UPF, first for Social Responsibility and currently for Social Commitment and Equality, which covers the areas of sustainability and mainstreaming of social commitment to university missions.

Marta Fonollida has been director of the Quality Assurance Agency for Higher Education of Andorra (AQUA) since 2015. She participated in several projects on the enhancement of quality and sustainability in higher education. In 2018–2019, she coordinated the project “Making connections between the institutional evaluation and the Sustainable Development Goals”, carried out in collaboration with the Aragon Agency for Quality Assurance and Strategic Foresight in Higher Education (ACPUA) and co-funded by INQAHE. She has been an assistant professor at the Faculty of Educational Sciences (Universitat Autònoma de Barcelona, UAB) since 2013 and at the Universitat Oberta de Catalunya (UOC) in the master’s programme Quality and Management in HEIs since 2019. She developed her research in the Complex Research Group (2014SGR543). She has a degree in Environmental Sciences and holds a PhD in Environmental Education.

Angela María Forero Orozco is a biologist who holds a master’s degree in Biological Sciences and a master’s degree in Environmental Management. She is a lecturer and member of the team that leads the Ecological and Environmental Management Plan of the Pontificia Universidad Javeriana - COSMOS. Her main areas of work are environmental management, sustainable universities and education for sustainable development.

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Eeva Furman is director of the Environment Policy Centre of the Finnish Environment Institute SYKE. SYKE’s mission is to support sustainable development with evidence-based and environment-focused understanding and solutions. Throughout her career, Furman has focused on sustainable development and sustainability transformations research. She is chair of Finland’s Sustainable Development Expert Panel and was one of the fifteen members of the independent group of scientists (OSI) who wrote the UN’s Global Sustainable Development Report, GSDR2019. Her activities, projects, presentations and positions of trust are in the fields of governance of sustainable development and systems transformation, biodiversity and health, ecosystem services and forests and nature-based solutions and urbanization and education, learning and the role of science in building paths for sustainable development.

Mar Grasa obtained a PhD in Biology from the Universitat de Barcelona (UB), where she is currently a lecturer in the Biochemistry and Molecular Biomedicine Department (Faculty of Biology). She is an expert in human nutrition, especially in the analysis of genetic and environmental factors related to obesity and diabetes.

Alison Greig is Director of Education for Sustainability at Anglia Ruskin University. Alison leads the education for sustainability research area at the Global Sustainability Institute (GSI). She is course leader for the master's degree in Sustainability. Alison started her academic career as a physical geographer and has always been interested in the interconnections between the natural world and human societies. Following a career in a number of university departments and as an independent environmental consultant, in 2011 she joined the GSI to take up the post of Director of Education for Sustainability. Alison is particularly interested in how formal and informal education can help prepare individuals to bring about change for a more sustainable future, and how educational institutions can facilitate this process. Alison has a close working relationship with SDS-UK, including as a member of the Responsible Futures Advisory Group.

Carme Gual holds a Degree in Law from the Universitat de Barcelona (UB) and has a postgraduate degree in Political Science. Her expertise in institutional communication and representation led to her position as director of the Catalan Agency for Cooperation and Development (ACCD), a position she has held since September 2017. She previously worked as Director of Strategic Projects and Communication at Foment de Ciutat SA. She has coordinated international relations for the Urban Habitat Department of Barcelona City Council and has been technical adviser for District X of the same city council’s Department of Cooperation, where she managed international cooperation and solidarity projects between Barcelona and cities such as...
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Ellen Hazellorn is joint managing partner of BH Associates education consultants. She is joint editor of Policy Reviews in Higher Education and a professor emeritus of the Technological University Dublin (Ireland). She is also an international co-investigator of the Centre for Global Higher Education (CGHE), London, and a research fellow of the Centre for International Higher Education, Boston College, USA. Ellen is a member of the Commission of the College of the Future (UK; 2019 2020), and the Quality Board for Icelandic Higher Education (2017 ). She was policy advisor to, and board member of, the Higher Education Authority (Ireland), 2011 2017, and president of the European Society for Higher Education, 2013 2016. Ellen has worked with international organizations and governments for almost 20 years, and regularly undertakes strategic and research evaluations for European and national research/scientific councils and universities.

Anne-Marie Laroche is professor in civil engineering at the Université de Moncton, where she specializes in water resources, including continental floodplain mapping, climate change, hydrology, hydraulics and GIS applications of water management in watersheds.

Natalie Jellinek is an educational developer and international higher education advisor at the Swedish University of Agricultural Sciences (SLU) in Uppsala, Sweden. She has a background in international and comparative education and coordinates internationalization initiatives in her division. Her work includes faculty development courses and workshops, consultancy in higher education pedagogy, and policy and strategy work related to the internationalization of education and intercultural competence. Natalie is currently designing a Global Challenges University Alliance (GCUA) network course focused on SDGs and intercultural competence and is coordinating a five-year SIDA capacity development project on doctoral supervision and generic skills in cooperation with the Universidade Eduardo Mondlane in Mozambique.

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Michela Mayer holds a PhD in Science Education and a master’s degree in Physics. She has been researcher at the Italian National Institute for the Evaluation of the Educational System (INVALSI) and an active member of the Environment and School Initiatives (ENS). As a member of the International PISA Science Expert Group (OECD), she collaborated in 2006 and 2015 in the definition of the science framework and items of quality checking for PISA science assessment. Since 2005, she has been a member of the UNESCO Italian National Committee for Education for Sustainable Development and 2030 Agenda Initiatives. She has been in charge of teachers’ education courses at the Università di Roma La Sapienza and Roma Tre, and guest lecturer in Barcelona, Seoul and Bogota. At present, she is associate researcher at IRPPS-Italian National Research Council and head of Educational Research at the Italian Association for Sustainability Science (AASS).

Vanessa Miguéz Martín holds a bachelor’s degree in Sociology and a master’s degree in International Migrations, Policies and Research. She is an officer at the Cooperation and Volunteering Office at the Universidad de A Coruña, Spain.
Richard Millican is a senior lecturer in education at the University of Gloucestershire. He has a long history of working within education, but in different contexts and phases. These include being a drama and music teacher across various age ranges, a teacher of learners with social and emotional difficulties aged 5 to 18, a teacher of English as a Foreign Language to children and adults, and a teacher trainer. He has worked in various countries including Spain, Oman and Egypt and in schools, further education colleges and universities including Leeds and Birmingham. His current interests lie in social justice and sustainability and in the role of education in helping to create a fairer and more sustainable world. He is working on an international research project. A Rounder Sense of Purpose, which is developing a competence framework for educators of sustainable development linked to the Sustainable Development Goals.

Joanna Morawska-Jancelewicz holds a PhD in Social Science (economics and finance). She has over 18 years of experience in administration and project management of international projects in the framework of the EU and national policies and funds. Joanna is a member of the presidium of the Polish Group for Socially Responsible Universities at the Ministry of Science and Higher Education. In 2017, she led the organization of the first Polish national conference on responsible research and innovation and the first Polish Festival of Social Innovation (2018). She has launched the Polish Forum of Engaged Universities (2019). Joanna is one of the principal investigators of the TeRRIFICA project. She was involved as a coordinator in establishing the first Science Shop in Poland at Adam Mickiewicz University in Poznan, where she also coordinates the Erasmus + Strategic Partnership Project: FIRE! Fertilize Innovation through Responsible Education.

Haidy Mousa is a recent graduate (2019) in Architecture from Cairo University. Her graduation project focused on creating a sustainable, futuristic, urban dynamic hub to inject activities into the heart of the city, energise sustainable transportation and urban farming in Egypt, and provide services for the historical Ramses Train Station that brings companies’ core business to sustainable development. In 2019, she co-authored a paper and contributed to the book Green Building and Renewable Energy Forum (MGF-S) in Italy in 2019. She was honoured and awarded the “Arab and African Promising Youth Award” by the President of Egypt at the closing ceremony and award session of the Arab and African Youth Platform, which is an integral part of the World Youth Forum (2019).

Carlien Nijdam has worked at the HZ University of Applied Sciences in Vlissingen since 2000. She is involved in education through her background in environmental sciences and her main interest lies in outdoor learning. This interest has been translated into cooperation with the Erasmus project “A Rounder Sense of Purpose”, where the SDGs in education play an important role. At the HZ University of Applied Sciences, she takes part in developing rich learning environments, such as practical research programmes and living labs, to develop competencies with a focus on constructive discussions, an inquisitive and reflective attitude and systemic thinking. Carlien is a lecturer in interdisciplinary collaboration and action research as well as a lecturer in science and technology at the teacher training institute. She coordinates the minor programme entitled “Becoming Fit for the Future”.

Marina Nin is a first year student of Global Studies (Universitat Pompeu Fabra) from Barcelona. Her deep interest in the stock market and crypto-currencies has led her to develop a research project on Bitcoin, for which she received from the ESCI-UPF institution the award for Best Research Work of the Bachelor in International Business, 2019.

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Estel Paloma is a PhD student at the Universitat Oberta de Catalunya (UOC). She holds a master’s degree in Entrepreneurship from Tecnocampus – Universitat Pompeu Fabra (UPF). She is associate professor of entrepreneurship at the Department of Social Science and Social Sciences at Tecnocampus, Universitat Pompeu Fabra (UPF).

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M. Beth Page founded Dream Catcher Consulting in 2004 and has since worked with many public and private sector organizations. As an associate faculty member at Royal Roads University, she contributes to leadership development on the master’s degree in Leadership. She also teaches in graduate certificates on Change Management and Strategic Human Resource Management. She has delivered experiential learning and executive education across Canada and in global settings such as Cambodia.

Joanne Pagé is Vice-President for Internationalization at the University of Bordeaux and teaches at the Department of Language and Culture. She has a strong interest in international learning and teaching and in wider educational development in higher education. She set up DAH International, a university-wide teacher training and development programme for international learning and teaching that has been in place since 2014. She is vice-chair of the EAIE Language and Culture Expert Community, assistant-editor for the European Journal of Language Policy and a board member of the French national association for language centres (RANACLES), affiliated to CERCLES. She was a member of the Erasmus+ strategic partnership EQUIP and has published on teacher development for internationalization.

Joanne Pagé is Vice-President for Internationalization at the University of Bordeaux and teaches at the Department of Language and Culture. She has a strong interest in international learning and teaching and in wider educational development in higher education. She set up DAH International, a university-wide teacher training and development programme for international learning and teaching that has been in place since 2014. She is vice-chair of the EAIE Language and Culture Expert Community, assistant-editor for the European Journal of Language Policy and a board member of the French national association for language centres (RANACLES), affiliated to CERCLES. She was a member of the Erasmus+ strategic partnership EQUIP and has published on teacher development for internationalization.

Francesc Pedró has been director of the UNESCO International Institute for Higher Education in Latin America and the Caribbean (UNESCO-IESALC) since May 2019. Dr Pedró worked from 2011 as head of the Education Policy Section in the Division for Policies and Lifelong Learning Systems in the Education Sector of UNESCO, Paris, where he evaluated education policies worldwide. He also contributed during his management to strengthening the work of the Education Sector on the
right to education and the use of technology, including the launch of UNESCO’s Mobile Learning Week that has been held annually since 2012. He has degrees in Philosophy and Education from the Universidad Autónoma de Barcelona (UAB) and a PhD in Comparative Education from the Universidad Nacional de Educación a Distancia, Madrid (UNED, 1985). He also holds a postdoctoral diploma in public education policies from the Institute of Education at the University of London.

Mariona Pérez Milà is a first year student of Global Studies (Universitat Pompeu Fabra, UPF) from Barcelona. Her main concerns are climate change and human rights, especially those of women and their health at international level. She believes in art and culture as crucial defining elements of societies and as elements of change.

María de Fátima Poza-Vilches is professor in the Department of Research Methods, Faculty of Education Sciences, and a member of the Research Group on Evaluation in Environmental, Social and Institutional Education of the Universidad de Granada (UGR), Spain, where she teaches on the methodology of programme evaluation in education. Her teaching activities include face-to-face and distance courses at undergraduate, master’s degree and doctoral level. Currently, she is a tutor for Erasmus students of the Faculty of Education Sciences studying in the Czech Republic, Slovakia, Hungary and Slovenia. Her research is focused on the field of programme evaluation in education, using action research processes. She also works on the evaluation of teacher training for skills development and the design of indicators to evaluate teaching practice for improvement.

María Teresa Pozo-Llorente is associate professor in educational research methods in the Faculty of Education at the Universidad de Granada (UGR), where she teaches programme evaluation and social work methodology. She has published a number of books on social work research methodology, programme evaluation and sociocultural centres. Since 2007, she has been performing management tasks in the field of university quality, first as director of the Office of Quality Assurance and Quality Improvement (2007-2015) and then as director of the Quality, Innovation and Prospective Unit of the University of Granada (2015-). She takes part in forums, international congresses and debates on quality assessment held at European (European Association for Quality Assurance in Higher Education [ENQA]), national (National Agency for Evaluation and Accreditation) and regional (Andalusian Knowledge Agency) levels. She is a part of the team of the European University Alliance (Arius).

Diane Pruneau is a professor at the Université de Moncton where she leads the Littoral et Vie environmental education group. Her research focuses on climate change education and the use of design thinking in environmental education.

Resma Punjabi has been a specialist in Quality at the Quality Assurance Agency for Higher Education of Andorra (AQUA) since 2018. In 2018-2019, she participated in the project Making Connections between the Institutional Evaluation and the Sustainable Development Goals. She graduated in Psychology and Educational Sciences and has worked in private and public sectors, always in areas related to personal and professional development, training, education and higher education. She has a master’s degree in Business Administration, a postgraduate degree in Banking Management and she is currently completing a master’s degree in Quality Management and Evaluation in Higher Education. She is also involved in an entrepreneurial project with social impact related to culture and education in Andorra.

Josep Ribalta is director of doctoral practice and member of the management board of the Universitat Rovira i Virgili (URV). He holds a degree in Biology from the Universitat Autònoma de Barcelona (UAB) and received a PhD from the URV together with University College London with extraordinary awards (1997). He is an accredited professor in the Department of Medicine and Surgery (2005) at the URV. Ribalta is co-principal investigator of the Research Unit in Lipids and Arteriosclerosis, a consolidated research group of the Government of Catalonia (SGR-127), and CIBER researcher for the study of diabetes and associated metabolic diseases (CIBERDEM). He is author of over a hundred indexed original articles, a patent and more than seventy national, state and expert papers from the European Commission for FP6, 7th PC and Horizon 2020 programmes. He is editor of the journal Clínica e Investigación en Arteriosclerosis.

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Marta Ruiz-Galán Gual is a first-year student of Global Studies (Universitat Pompeu Fabra, UPF) from Barcelona, Spain. She is passionate about languages, art, and discovering new cultures. The opportunity to meet new people from different backgrounds is appealing and enriching to her.

Quinn Runkle is Director of Education at Students Organising for Sustainability (SOS-UK). Quinn’s work focuses on transforming further and higher education into a force for good to create a more just and sustainable world. Quinn joined the National Union of Students in 2014 and she has a background in student and staff behaviour change, engagement and education for sustainable development programmes at the University of Bristol (UK) and the University of British Columbia (Canada). Quinn holds a bachelor’s degree in Geography and Political Science with a specialisation in Environment and Sustainability from the University of British Columbia. She is currently pursuing a doctorate in Education at the UCL Institute of Education. In 2017, she was listed as one of the Top 30 Under 30 Environmental Educators by the North American Association for Environmental Education. She is co-founder of the Italian Association for Sustainability Science (IASS) of which she currently serves as director.

Teresa Sauras-Yera is teaching innovation coordinator and programme coordinator for the bachelor’s degree in Environmental Sciences, and associate lecturer in the Department of Evolutionary Biology, Ecology and Environmental Sciences, Faculty of Biology, Universitat de Barcelona (UB).

Michaela Shields has worked in the field of sustainable development and event management in Bonn since 2011. She is actively involved in the H2020 Projects BLOOM and TeRRIFICA in the organization of stakeholder engagement activities, workshops and the dissemination of relevant project information.

Mireia Sibil is a first year student of Global Studies (Universitat Pompeu Fabra) from Vilafranca del Penedès near Barcelona. Her hobbies are reading, outdoor sports, socializing with friends and Castells (human towers). She has recently discovered an interest in international law and is considering studies in this area.

Kate Sposab is national coordinator of the TeRRIFICA project for the pilot region of Minsk, Belarus. She holds a diploma in Germanic Studies and a master’s degree in Education from Zug University. She is a PhD candidate in Educational Studies, Education for Sustainable Development, at the Maxim Tank Belarusian State Pedagogical University (BSPU). Since 2018, she has been project manager at the Education for Sustainable Development Association. In 2017, she started work as education researcher at the Coordination Centre “Education for Sustainable Development”, BSPU, and as coordinator of the Regional Centre of Expertise on Education and Sustainable Development – RCE Belarus. Since 2010, Kate has participated as project assistant and project manager in ten international projects on sustainability in education and global and European citizenship, among other topics, and in around twenty mobility exchanges, trainer trainings and workshops in European countries and Hong Kong.

Laura Steinhaus focuses on international culture and management with a specialization in cross-cultural management. She has worked at Bonn Science Shop as a research assistant since April 2017. Laura is currently involved in the management of two European H2020 projects: TeRRIFICA and BLOOM.
Norbert Steinhaus has been a board member of Wissenschaftsladen Bonn (Bonn Science Shop) since 1990. For the last 20 years, he has cooperated in international projects on citizen participation in research or responsible research and innovation. Currently, he coordinates the H2020 project TerRIFICA and is involved in the H2020 project BLOOM. Since 2007, Norbert has coordinated Living Knowledge, the international Science Shop network. In 2014, he was a member of the steering committee for the SIS-RII conference, which was organized by the National Research Council of Italy and held in Rome within the 2014 Italian Presidency of the European Union. He has recently been active in the Horizon Europe mission assembly for Soil Health and Food.

Chris Steuer is sustainability director at Millersville University, where he coordinates and advances Millersville’s sustainability initiatives and programmes, including developing and implementing MU’s Climate Action Plan, incorporating sustainable management principles into MU’s activities and operations, and increasing awareness of MU’s commitment to sustainability. Previously, Mr. Steuer was a senior sustainability management consultant for ICF, where he helped to develop sustainability and greenhouse gas management programmes for various public and private sector clients, including the National Park Service, US Environmental Protection Agency and US House of Representatives. Mr. Steuer holds a bachelor’s degree in Earth Sciences and a master’s degree in Geography from Pennsylvania State University.

Enric Tello obtained a PhD in History from the Universitat de Barcelona (UB) and is currently a lecturer in the Economic History, Institutions and Policy and World Economy Department. His fields of research are economic history, sustainable development, social metabolism and changes in land use, as well as methodological aspects of economic and environmental history.

Pietro Tonini is a PhD research student in Barcelona. He holds a bachelor’s degree in Agribusiness and a master’s degree in Horticulture Science. He received the Best Paper Award at the fifth edition of the Med Green Forum in Italy 2019, which was later published in a Springer Nature book entitled Green Building and Renewable Energy. Mr Pietro won the International UrbanFarm 2019 Competition in Italy, where he received The Second Prize and Young Minds Award from the International Society for Horticultural Science (ISHS). He worked as a field supervisor in the project Soilless Horticulture and other Water-saving Innovative Technologies for Landless and Marginal Farmers (SOW-IT), managed by Terres des Hommes Italy. In addition, he was a researcher on the positive effects of Conservative Practices on soil quality and vegetable production in the Central Dry Zone of Myanmar, sponsored by the Agroecology Learning Alliance in South-East Asia, 2018 FAO.

Silvia Udwayr studied sociology at the University of Vienna with a focus on social structure and social integration. Her graduate research on the motivation behind environmental behaviour took a holistic approach, influenced by the figure theory of Norbert Elias. Her focus since 2017 has been on sustainable development and the SDGs in teaching, research and organization at UAS St. Pölten. This has involved participating through ERASMUS in an exchange programme at Nottingham Trent University and at the Universitat Politècnica de Catalunya-BarcelonaTech (UPFC) on Sustainable Development in Higher Education. She has also delivered guest lectures at Groningen Hanzehogeschool on SDGs and Social Work and at UAS Joanneum on an Introduction to Sustainable Development and SDGs.

Jennifer Valcke is an educational developer and senior lecturer for the Teaching and Learning unit at Karolinska Institutet (KI) in Stockholm, Sweden. Her role includes teaching, training and advising on issues related to international education, intercultural education and Content and Language Integrated Learning. Jennifer provides support and prepares teaching staff for the challenges of multilingual and multicultural learning spaces. She is involved in ensuring quality in English-medium instruction and she also supports educational leaders in the implementation of KI’s internationalization strategy. From 2017 to 2020, Jennifer has led research into the internationalization of the curriculum in five of KI’s study programmes, funded by a Strategic Grant from the Swedish Foundation for International Cooperation in Research and Higher Education (STINT).

Elke van der Valk is a regionalization and SDGs consultant at Fontys University of Applied Sciences and is responsible for connecting Fontys as knowledge partner to regions in the southern Netherlands. She is part of the SDG Coalition that was created amongst universities of applied science in June 2018 and coordinates the platform www.sdgsonstage.nl, which is created to connect students, teachers and businesses through SDG-related content and internships. She is multilingual, and the reach of her work is intercontinental: she has been the
Erasmus coordinator at Fontys, coordinated grants and scholarships at Utrecht University of Applied Sciences and overseen European projects at Casa de la India, bringing European and Indian cultures closer together through educational, cultural and cooperation projects. Elke is currently a steering group member in the Expert Community on Employability of the European Association of International Education.

Paul Vare is a postgraduate research lead at the University of Gloucestershire’s School of Education in the UK, where he also runs international research projects on education for sustainable development (ESD). Paul has over 30 years of experience in ESD extending from environmental education in the UK to long-term international development projects and corporate social responsibility programmes. He has represented the European ECO Forum at the United Nations Economic Commission for Europe (UNECE), where he helped to draft the UNECE ESD Strategy and served on expert groups to develop ESD indicators and competences for ESD educators.

Eduardo Velázquez Romero holds a bachelor’s degree in law from the National University of Asunción (UNA), a master’s degree in international studies from the Universitat de Barcelona (UB) and a master’s degree in law from the National University of Asunción. His other studies include specialist in education from the Universidad Iberoamericana, a postgraduate course in mediation and conflict resolution with the University of Buenos Aires and the Libra Foundation, and a postgraduate course in management of international relations in higher education institutions from the University of Guadalajara. He worked as manager for the Universidad Iberoamericana in international projects funded by the European Union, the Inter-American Development Bank, UNICEF, the Organization of Ibero-American States, and others. He has also been academic director at the Universidad Iberoamericana and professor in the law schools at UNA and Universidad Iberoamericana.

Eva Vendrell is a project manager at the Innovation and Community Bureau of the Universitat Politècnica de Catalunya-BarcelonaTech (UPC) where she works to support the growth of a collaborative organization and culture at the university.

Eva Vidal teaches at the school of telecommunication (ETSETB) and is the director of the Center for Development Cooperation (CCD) of the Universitat Politècnica de Catalunya-BarcelonaTech (UPC). Josep M. Vilalta is director of the Global University Network for Innovation (GUNi) and executive secretary of the Catalan Association of Public Universities (ACUP). He is a specialist in public management and public policies and in higher education and research management. He has thirty years of experience in leading positions in public sector organizations as well as in various higher education institutions. He has published nearly a hundred papers for journals and publications, book chapters and books on public administration, public policy, education, universities and scientific research policy. He is a regular contributor to national and international publications and to the newspapers ARA, NacióDigital and La Vanguardia. He holds a degree in Geography and History (UB), a master’s degree in Public Management (UAB), a master’s degree in Political and Social Theory (UPF) and a postgraduate diploma in Management of Higher Education (Open University/Universitat Twente).

Thushari Welikala is a senior lecturer in higher education at St George’s University of London and a visiting lecturer at King’s College London. Prior to joining St George’s, she worked at the UCL Institute of Education, the University of Nottingham and King’s College London. Thushari has developed a research background in internationalization and intercultural aspects of teaching and learning. She is an ordinary member of the executive committee of the British Association for International and Comparative Education (BAICE) and co-author of the book Improving Intercultural Learning Experiences in Higher Education: Responding to Cultural Scripts for Learning. Her expertise in internationalization has been shared through her contributions to developing institutional internationalization strategies, consultancy work across countries and offering advice as an external research expert for international research consortia.
Daniel A. Wubah is the president of Millersville University, which is part of the Pennsylvania State System of Higher Education. Previously he served as provost and later as senior advisor to the president at Washington and Lee University as well as the deputy provost and vice-president for undergraduate education at Virginia Tech; associate provost and professor of zoology at the University of Florida; associate dean, professor of biology and special assistant to the president at James Madison University; and associate professor and department chair at Towson University. He is an elected fellow of the American Association for the Advancement of Science and he has testified before the US Congress on how to prepare the science workforce for the twenty-first century. Dr Wubah earned a bachelor’s degree with honours in botany and a diploma in education from the University of Cape Coast, Ghana. He holds a master’s degree in biology from the University of Akron and a PhD in botany from the University of Georgia.
ANNEX – Higher education initiatives for the SDGs
Initiatives presented in poster format

- Implementation of the SDGs in the Strategic Planning of the Universidad Simon Bolivar in Colombia as a good practice for sustainable development
  Authors: Gabriel Orozco, Fernando Morón, Juan Bell & Gina Patiño (Universidad Simón Bolívar, Colombia)

- A Low-tech Plastic Recycle Experience for Social Transformation Rosario Pastor Universidad Federal de Bahia & Universidad Autónoma de Barcelona
  Authors: P.A.P Gomez, L.R. Rocha, J.S. Jesus, Y. Pellissier (Universidade Federal da Bahia), A. Mias (Universitat Autònoma de Barcelona), R. Pastor and J. Morató (UNESCO Chair in Sustainability at UPC-BarcelonaTech)

- Enhancing Collaboration between Higher Education and Learning Cities through Service-Learning Partnerships in attaining Sustainable Development
  Author: Bisini Naidoo (University of South Africa)

- Emotionally Durable SDG Designers
  Authors: Thomas Østergaard (VIA University College, Denmark) and Ainoa Abella (ELISAVA Barcelona School of Design and Engineering, Spain)

- Commitment with SDGs from university, students and teachers, from the service learning methodology
  Authors: Begoña Cabanés-Cacho, Nieves García-Casarejos, and Israel Romera (University of Zaragoza, Spain)

- Support Programme of the University of Barcelona for Refugees and People from Conflict Zones
  Author: Catalina Jerez (Solidarity Foundation of the Universitat de Barcelona, Spain)

- Service-Learning at the University of Barcelona (UB): how SL can help us meet the Sustainable Development Goals (SDGs)
  Authors: Marta Pérez, Anna Eso, M.C. Poblet and M.T. Vilalta (Universitat de Barcelona, Spain)

- Sustainability and the SDGs in African Higher Education Institutions (HEIs): Shifting the focus from researching the lacks to existing activities
  Authors: Nico Ulmer, Kerstin Wydra (University of Applied Sciences Erfurt/Germany), Maik Adomssent (Leuphana University Lüneburg/Germany), Karoli Njau (Nelson Mandela African Institute of Science and Technology, Arusha/Tanzania)

- Ocean Literacy - Implementation of SDGs in Teacher Education
  Authors: Agneta Rehn (Malmö University, Sweden) & Kerstin Sonesson (Malmö University, Sweden & University South East Norway, Norway)

- Implementation of a Sustainable Campus; Positive Environmental Practices at the Universidad Autónoma de Occidente (UAO)
  Authors: Luis Francisco Amar Cabrera & Hernando Unbe Castro (Universidad Autónoma de Occidente, Colombia)

- Sustainable Development Goals and Social Work Education. How students’ placements in the Global South can contribute to achieving the SDGs
  Authors: Karen Moeser & Silvia Udvardy (University of Applied Science St. Pölten & University of Applied Sciences Joanneum, Austria)

- SDG and Circular Competencies Changes for HE Lecturers: Teaching the teachers SDGs and CE
  Authors: Torsten Sack-Nielsen and T. Østergaard (VIA University College, Denmark)

1. All posters can be consulted in the GUNi Conference website: www.guninetwork.org/activity/international-conference-sustainable-development-goals-higher-education-science-take-action
- Co-creation alliance for supporting refugee families
  Authors: Lucía Jiménez, Victoria Hidalgo, Irina Nogales, (Universidad de Sevilla, Spain), Centre for Refugees of Seville, Sofia Baena (Universidad Loyola, Spain) & Jesús Maya

- The Impact Ranking: a new set of indicators for universities
  Authors: Flavia Colus, Daniela Atäes and Rafael Locci (University of Campinas, Brazil)

- Can teachers be SDG activists?
  Author: Dolors Setó-Pamies (Universitat Rovira i Virgili, Spain)

- Seeing the world on a small island: undergraduate research for sustainable societies
  Authors: Jocelyn Ballantyne, Rob van der Vaart (Utrecht University, the Netherlands) and Eric Mijts (University of Aruba, Oranjestad, Aruba)

- Construction of the Environmental Institutional System. Sustainability Policy at an institution of higher education
  Author: Esperanza Padilla (Politécnico Internacional, Colombia)

- Retrofitting of an existing governmental & training building to become smart and partially dependable on renewable energy attaining SDGs
  Authors: M. Aboulnaga, S. Elhaggan, M. Shahwan, M. Matbouly, F. Omar and Y. Ragab (Cairo University, Egypt)
• Revolution. The potential of reducing social inequalities in education through immersive virtual reality content.

Authors: Gabriel Orozco, Fernando Morón, Juan Belf & Gina Patrile (Universidad Simón Bolívar, Colombia)

2020 - the year of gamified VR in education. Driven by technology, the future of education must happen now. Social researchers around the world have to respond to the uncontrolled world that software companies are producing with only profit in mind. On the other hand, the lack of quality education will be amplified in the next few years due to the workforce crisis in many rural areas of EU countries, such as Romania or Bulgaria.

The appropriate response is social research that merges classical approaches with gamification, social media and virtual reality. Developing and testing teaching methods using the latest VR technology in order to gain the interest of children worldwide is of utmost importance.

• Towards a more transversal university: exploring PBL-SDG innovative strategies to contribute to sustainable development.

Authors: Maria Llerena, Mar Carrío & Davinia Herández (Universitat Pompeu Fabra, Spain)

If you could choose how and what to learn, what would you ask for? With a view to the Global Education 2030 Agenda and with the aim of creating innovative learning methods and teacher collaboration strategies, this project explores how the SDGs can be transversely implemented on the Human Biology bachelor degree and how sustainability competences can be developed among students. It creates and implements new learning aids based on PBL-SDG and, finally, proposes the creation of an online teaching network to co-design PBL materials related to the SDGs.

• Teaching the SDGs with audiovisual tools

Authors: Carmen Parra (Abat Oliva CEU University, Spain) & Yolanda Cruz-López (Universidad de Almería, Spain)

Based on the fact that young people mainly belong to the audiovisual culture, the objective of this proposal is to raise awareness among the university community of the educational and cultural possibilities offered by cinema to know about and be aware of the SDGs.

This involves the need to train both students and teachers who know how to use the language of cinema to interpret respect for and social commitment to the SDG, promoting a critical spirit, making them responsible and analyzing everyday situations that will allow them to adopt positions to achieve the 2030 Agenda.

• Teaching for Sustainability How to Implement the SDGs on an Interdisciplinary Course for International Teacher Students

Author: Kerstin Sonesson (Malmö University, Sweden & University South East Norway)

International teacher students with varying knowledge, experience and understanding of sustainable development and ESD meet in Teaching for Sustainability, 15 credits https://edu.mah.se/en/Course/NM164E.

A challenge or a possibility for deep learning by students? Presentation of students’ reflections on some democratic and student-centered activities:

• Portrait and interview – Icebreaking and making heterogeneous groups.

• Student-active literature seminar – Formulate questions of interest and hold a discussion after reading The world we’ll leave behind (Scott & Vare, 2018).

• Challenge-based learning on the SDGs - Finding out about a selected SDG, on a local and global level, using creativity and innovative skills to increase awareness.

• SoScience

Author: Yoann Malinge (SoScience)

The Future Of programs are a proven turn-key methodology that allows public research institutes, universities and private
R&D or innovation departments to address social and environmental challenges. By gathering 30 to 50 relevant actors (scientists, social entrepreneurs, companies and industries, nonprofits, etc), this open innovation process aims to generate collaborative projects, tackling a scientific and societal problem. The Future Of are developed by SciScience, a European based company specialized in Responsible Research and Innovation. If you are interested in learning more about such a program or in learning how to run one yourself, please come and meet us!

- **Open Knowledge as a key driver for contributing to the SDGs: the example of the Open Knowledge Action Plan at the UOC**
  
  Authors: Nadja Gmelch, Gemma Xarles & Pastora Martínez (Universitat Oberta de Catalunya, Spain)

Knowledge is one of the key elements for achieving the 2030 Agenda. However, we are currently faced by obstacles that prevent us from adding and sharing our knowledge. There is an increasing amount of evidence that supports the growing need to renew the system of knowledge generation and transfer.

In this context, universities must change and reconsider their role in society. At the UOC, we are committed to transformation through becoming a knowledge hub. This involves opening up the University in all ways and making it into a more porous institution, with two-way connections to various stakeholders and groups in society. We wish to deepen discussions with the audience on the relationship between Open Knowledge, Open Science and the achievement of the SDGs and share the work we are fostering at the UOC through our Open Knowledge Action Plan.

- **NUI Galway Sustainability Strategy 2017-2020: Learn-Live-Lead**
  

At the National University of Ireland, Galway, our Learn-Live-Lead approach places students at the heart of the sustainability journey and promotes sustainability scholarship, environmental stewardship and global citizenship as key student attributes. The aim with learn is to embed sustainability literacy into all aspects of university learning and research so that students gain the necessary knowledge and skills to foster sustainable thinking and decision-making even after graduation. The aim with live is to implement the principles of sustainability through campus operations so that graduates understand the importance of sustainable living in all aspects of their lives and value their connection to the physical environment and biodiversity. The focus of lead is on graduating students that are socially aware and valued for their world readiness.

Find out more at www.nuigalway.ie/sustainability

- **Life Sciences Universities engagement for the SDGs: a practical case**
  
  Authors: Astrid Ballesta (Universitat de Lleida, Spain) & M. Aran (Soil section-Catalan Agricultural Studies Institution-Institute of Catalan Studies & Spanish Soil Science Society)

How can the 2030 Agenda reach scientists? How can Soil Scientists be convinced that they are already working on SDGs? And that they have to go further? Soils are fundamental for agriculture, food production, the environment and biodiversity. The word “soils” appears several times in target description and indicators. On the 5th December, World Soil Day (UN), a workshop on “Soils and SDGs” was organized at Universitat de Lleida involving the participation of the Soil Scientist Community. The experience showed that UN International Days can be a good opportunity to enhance the engagement of universities and other stakeholders with the 2030 Agenda.

- **Increasing the impact of research: Learning from the CIRCLE Programme**
  
  Authors: V. Buckley, G. Lakey and B. Prasad-M-Halls (The Association of Commonwealth Universities)

“Since 2014, the Climate Impacts Research Leadership and Capacity Enhancement (CIRCLE) Programme has worked with African researchers and their home institutions to improve their contribution to global climate change literature and to increase the impact of outputs via research uptake activities. To date, 3000+ stakeholders have been engaged, learning about research and how they can utilise findings. I will be discussing the successes and challenges encountered by our Fellows, and the valuable insight they have provided on how institutions and funders, as well as the ACU, can adapt their approach to addressing the SDGs.”

- **Engaged Scholarship in Higher Education Institutes: Converging Theory and Practice**
  
  Authors: Manju Singh & P. Bhatt (Malaviya National Institute of Technology Jaipur, India)
The gap between academia and the community results in huge differences between “readings of the word” and “readings of the world”. Academia often ignores indigenous knowledge available from community members. This calls upon the need to revisit the teaching-learning approach and redefine the role of Higher Education Institutions in order to build truly engaged campuses for the decolonization of knowledge, a pathway towards sustainable development.

The present work highlights the movement to upscale Community Based Participatory Research Skills at one of the Institutes of National Importance in India. This unique initiative brought about a paradigm shift in student perceptions, priorities and practices. A sparking impression is observed in their young minds for socially responsible education, a step towards knowledge for change.

- Education on Climate Change for Schools – by Students and Alumni of the University of Graz
  Authors: Lena Valentina Mair & Laura Eva-Marie Haberfellner (University of Graz)
  Climate Change is the most pressing challenge of our time. The aim of our project is to provide scientific knowledge to pupils, in order to enhance their understanding of the climate system and climate policies and to increase the awareness for the need of a sustainable way of life. To achieve that, we formed a network of schools, teachers and students in Graz and elsewhere in Austria. We provide scientifically proven presentations, which students use for their workshops to present scientific knowledge in an interactive way. Within the self-organizing network, teachers and students can easily arrange a suitable workshop in class.
  [https://ccca.ac.at/wissenstransfer/klimabildung-fuerschulen-vermittlungsprojekt contact: servicezentrum@ccca.ac.at]

- CBR for the Humanities: an antidote to indifference
  Authors: J. Ballantyne, D. Cole, M. Huisman, S. Sprenger, R. Supheert and B. Waaldijk (Utrecht University, the Netherlands)
  Our teaching project enhances humanities students’ societal engagement and enriches their understanding of the relevance of their education. It employs community-based research (CBR) projects, with its emphasis on co-creation of knowledge, to help students reflect on the contributions that the humanities can make to the SDGs, locally as well as globally. Our first year involved organizations focused on the integration of migrants in the Netherlands, offering outreach and connection with diversity in the city of Utrecht at large. In coming years, the project will include a wider array of community organizations, aiming to deepen interdisciplinary collaboration by students and faculty members.

- BC iTversity, an inclusive educational model for effective regional development
  Authors: Enrico M. Jacobs, M. Joris and K.A. Willems (Belgium Campus [University, South Africa])
  Belgium Campus [BC] iTversity operates an integrated concept of knowledge valorisation through the Participative Development Model for Education (PDM) and the Collaborative Innovation Model for Regional Development (CIM). It offers students a learning journey throughout the value chain of knowledge valorisation, so they acquire globalcompetences and are ready to face the challenges of the SDGs.
  During the speed dating presentation, the required graduate’s profile is evaluated in order to be skill-apt for the challenges of the rapidly changing world. What is the role of higher education in the Knowledge-Era, and how do we ensure that the students acquire the correct knowledge, skills, attitudes, and behaviours?
  The CIM is an innovation ecosystem nurturing a co-creative collaborative approach that equitably involves all stakeholders, i.e. academia, students from different disciplines, corporates and SMEs, the community, to create and capture new value. The CIM has a specific focus on creating sustainable solutions focussed on the SDGs.
  This is illustrated during the speed dating through an example, i.e. modular smart aquaponics system.

- Associació d’Estudiants pel Medi Ambient (AEMA) – Association of Students for the Environment
  Authors: Lola Berna & Carina Casadesús & Belén Ferrer (Universitat Pompeu Fabra, Spain)
  Despite its short existence as a student-led organization, AEMA has had a huge impact on the University. The UPF is firmly committed to the “Planetary Wellbeing” project, but it must be followed by the pertinent measures. AEMA’s role this last year, for example, in encouraging the removal of plastic water bottles has been decisive, but it must keep going and get even stronger. The goal is to achieve a zero-waste university that is exclusively supplied by green energies and, together with the UPF, AEMA will work towards this.
This book is printed on paper suitable for recycling and made from fully managed and sustained forest sources. Logging, pulping and manufacturing processes are expected to conform to the environmental regulations of the country of origin.