

The Role of Universities in Sustainable Development. The University of Rome ‘Tor Vergata’: A Place of Knowledge and Promotion for Sustainable Projects

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Abstract. *In the panorama of international strategies and commitments to sustainability, education is central to the pursuit of sustainable development. Educational institutions at all levels are playing a new role in promoting values and ideals linked to sustainable behavioral models. These models are capable of facing the complexity of reality in a cooperative, active and responsible way, opening up to a vision for shared solidarity and progress. In this context, universities face a huge challenge. They must recognize the changes happening in society and change themselves. Universities are therefore increasingly called on to take an active role in introducing attitudes and behaviors in favor of sustainable development and in involving the entire academic community in this process. The aim of this paper is to define the role of universities in sustainable development. These institutions are not only a ‘place’ where professionals are trained, but also their roles and responsibilities mean that they have a strong influence on the societies where they operate. In order to be sustainable and ensure that their respective territories can set off along these lines, universities must change internally and begin systemic processes to engage all members of their communities. After a detailed literature review, this paper explores how sustainable development should not be exclusively used in didactic activities, but also in educational paths to affect the way students think and act within their own academic communities. Given the objective of this work, a case study is used to describe the results of active change inside the Roman University of ‘Tor Vergata’.*

Keywords: *Students engagement; sustainable development; EducAction; sustainable projects; higher education*

Introduction

Universities are increasingly aware of their role in society. Today, it is essential to consider the issue of sustainability and the need to develop concrete actions to reach a sustainable future. Ultimately, this must happen through education. Yet, it is crucial to instill these principles from an early age when it is easier to shape individuals. During adulthood, people reach maturity, which is often characterized by tertiary education. At this time, people also notice their individual responsibility for sustainable development at a

global level. Universities, in their capacity as social institutions, have a great responsibility to imagine and define the future of the world, their society and the rising generations.

Universities take on the task of developing concepts, corroborating them with empirical evidence and teaching them to students in order to contribute to social progress and advancements in knowledge. However, universities have a profound responsibility to act as sources of vision with a mission that goes beyond technical knowledge. Today, this vision concerns sustainable development (Arbuthnott, 2009; Dagiliute, Liobikiené, & Minelgaitė, 2018; Kearins & Springett, 2003; Soini, Jurgilevich, Pietikainen, & Korhonen-Kurki, 2017; Yarime, et al., 2012). It is therefore not surprising that many universities have identified sustainability as a central part of their courses, research and community service.

This document highlights some initiatives carried out in the past year at the University of Rome 'Tor Vergata'. These initiatives have increased the University community's interest in supporting the institutions' sustainable growth. This paper starts with an analysis of these projects, as the authors have been directly involved in their planning and coordination.

Education and sustainability: meanings and scenarios

For several years, sustainable development (Brundtland Report, 1987) has attracted public and private interest (i.e., institutions, schools, companies and associations). The rise of sustainable development has inspired them to become involved in academia as they rethink their missions and put sustainability at their core.

An analysis of the specialist literature allows us to understand its role in spreading the principles and methods of sustainability (Lozano et al., 2015). This started with a large number of universities worldwide that since 1990 have formally signed commitments aimed at implementing sustainability. In addition, numerous international networks have connected 'sustainable universities' committed to realizing innovative practices, initiatives and pilot projects with a significant impact at the managerial and/or curriculum level. Many of these efforts have focused on minimizing the institutions' ecological footprints, for example, by reducing energy consumption, rather than on virtuous practices like waste management or low environmental impact mobility.

However, international literature shows that, despite these positive signs, the role of universities in spreading sustainability must not be confined exclusively to scientific research or management practices. Universities are, in fact, responsible for training future citizens, politicians, decision-makers and professionals. Thus, they should be called on to take a greater step towards sustainability by reflecting on their own impact from an educational point of view. In particular, academia must deal with sustainability from multiple perspectives with the awareness that the training offered by the universities must respond to the demands of a rapidly changing society. Universities also function in a world that requires professionals not only with specific disciplinary skills but also with a systemic perspective based on the knowledge of transversal and transdisciplinary aspects. This requires universities to provide each student, regardless of their specialization, with educational opportunities on sustainability. This is especially true since the professional world is increasingly looking for graduates with knowledge and skills in this area.

This change of course not only necessary but also now invoked by many. There are still many initiatives and activities that function on the implicit assumption that a good education and information on emergencies of the planet or on sustainability. These are sufficient to guarantee that new generations are aware of and ready for that much-desired change. This form of education on sustainability, which considers the inclusion of sustainability and its contents within existing training courses to be sufficient, cannot be the only contribution to sustainability that the academic world provides. Expert debate notes that the challenge of sustainability cannot and should not be exhausted with the simple 'sustainability pills' in the curricula of different courses of study and teaching. Rather, it requires a new approach to training with far more ambitious and complex objectives.

In international literature, it is important to note how the links between education and sustainability are referred to (e.g., education for sustainability, education-oriented towards sustainability, education for sustainable development). These links refer not only to knowledge but also to experiences and behaviors. Indeed, in documents prepared for the Rio Summit (1992), education was considered critical for promoting

sustainable development and improving people's capacity to address environmental and developmental issues. Education was also noted as important for achieving environmental and ethical awareness, values and attitudes, skills and behavior consistent with sustainable development, and effective public participation in decision-making (Chap. 36, Agenda 21).

Numerous events and documents in recent years have helped consolidate the strategic role of education in sustainability. They have strongly confirmed the importance and urgency to review not only the contents but also (and perhaps above all) dominant 'transmissive' teaching practices. Instead, education on sustainability must take a 'transformative' (i.e., sustainable education) approach (Sterling, 2013) that is able to give strength to new behaviors and lifestyles. Thus, the main objective of this type of education is 'learning for change'.

In light of this, universities should train tomorrow's citizens by providing them with new knowledge and affirming the logic of the complex system. Universities should also incentivize the decomposition of knowledge, and interdisciplinary dialogue (Fornasa & Salomone, 2007), as well as supporting a reflection on values, attitudes and behaviors (i.e., individual, community, professional). This is a challenge still little known by the academic world, which usually attributes families, society or education with the role of reflecting on lifestyles.

In this regard, UNESCO recently reflected on the learning objectives that can be linked to the 17 sustainable development goals (SDGs) that shape the 2030 Agenda. The organization considered it necessary to emphasize how sustainability education 'does not only concern the teaching of sustainable development and adding new content to courses and training. Schools and universities should see themselves as places of learning and experience of sustainable development and should, therefore, orient all their processes towards the principles of sustainability' (UNESCO, 2017). The awareness of the need for a decisive change of perspective should, therefore, translate into profound changes in the way education and education for sustainability are carried out at a university level, both in terms of the content taught and the teaching methods used. Re-orienting university education towards sustainability in this broad perspective means being more responsive to the demands of a rapidly changing society and a professional world that considers 'innovation' and 'change' to be key words, not simply 'integration'.

In light of this, academic institutions (e.g., students, professors, technical/administrative staff) should be configured as 'change' agents, protagonists of change that are acted out, visible and coherent with the content taught, not only vehicles to promote change in the professional world. This would be possible thanks to the fact that higher education has academic freedom and the critical mass and diversity of skills to develop new ideas, comment on society and its challenges, and engage in bold experimentation with sustainable living (Cortese, 2003).

Italian universities, following what has been happening for some time at an international level and also through the confrontation generated within the RUS (Rete delle Università per lo Sviluppo Sostenibile)¹, have been moving towards sustainability for some years. A certain number of training and educational activities are aimed at making sustainability education the cornerstone of an 'investment for the future' (UNESCO, 2009). However, the methodological aspects mentioned above have not yet been realized.

Currently, the educational courses at Italian universities are oriented towards education about sustainability. The debate is on including sustainability as a discipline in its own right or within the training courses provided. Training courses would enhance only content-based aspects and consequently risk of not recognizing sustainability's transversal nature, losing its inter- and transdisciplinary value and not promoting the acquisition of skills (UNESCO, 2017; 2014) that indispensable to being "citizens of sustainability" (Wals, 2015; Leicht et al., 2018). Education on sustainability is not only required for all of these reasons, but also to rethink the formal education system globally: from teaching to research to the third mission, from management to leadership, from the role of students and teachers to the relationships that are created with the territory, and to the interventions and policies that dictate the daily life of educational institutions (UNESCO, 2014).

Thus, redirecting university curricula towards sustainability cannot be considered sufficient to activate profound and global change. Universities much instead create "... a sustainable educational paradigm lived

¹ Network of Italian Universities for Sustainable Development

[...] to embrace and suggest a new participatory epistemology” (Sterling, 2013, p. 28), as well as to rethink their design in response to constantly changing questions and problems. In this way, universities much reimagine their vocation to “... form in individuals, not simply the keys to learn statically, but to learn, evolutionarily ...” (Bocchi & Ceruti, 2004, p.17) and recognize that education is, in the fullest sense of the term and today more than ever, an essential investment in the future.

University of Rome ‘Tor Vergata’ for sustainability

We will now analyze best practices oriented to sustainable development at the University of Rome ‘Tor Vergata’. The choice to include these projects in the discussion is justified by the fact that these initiatives not only represent the result of some activities but are configured as the nexus of community-wide change. This is because the projects aim to be inclusive, involving everyone and motivating the whole community to promote certain behaviors.

Since 2015, the University of Rome ‘Tor Vergata’ defined its mission and vision in favor of sustainable development to become, through continuous change, academically excellent in the European context. Research, teaching, international, technological, economic, organizational and social development are key factors in realizing this goal.

In pursuit of its mission and vision, the University joined the Network of Italian Universities for Sustainable Development (‘Rete delle Università per la Sostenibilità’, RUS) established by the Conference of Rectors of Italian Universities (CRUI) and, together with the Unipolis Foundation, gave input to create the ‘Italian Alliance for Sustainable Development’ (ASviS). This alliance aims to awareness of the global Agenda and 2030 SDGs among Italian society, economic subjects, and institutions.

Hence, projects aimed to spread sustainability issues and culture and, at the same time, create improvements in terms of the environmental impact of the University. The ideas reported arose from a participatory group of students and technical-administrative personnel interested in sustainability. In particular, two interdepartmental projects are analyzed to help understand the transversality of concepts linked to the theme of sustainability between the different subjects and departments.

I GREENtosi – the green cultural association of the University

The first project intends to actualize and underline an idea born inside the ‘New Economy Labs’²: the definition of a green cultural association (i GREENtosi) that will nurture an innovative culture oriented toward socio-environmental progress. This starts with a change in students’ mindsets to favor environmental protection.

A group of students at ‘Tor Vergata’ University wanted to challenge the entire academic community to change their habits and adopt proactive and sustainable attitudes and behaviors from an environmental, social and economic point of view. Hence, the name ‘i GREENtosi’ indicates concrete actions in favor of green activities at Athenaeum.

I GREENtosi was formally established in March 2019 as a green cultural association with to promote sustainability and managing both the incentivizing compactor and the relationship between partnership-companies in cooperation with the academic community. To date, the association has over 150 members, including students, alumni, professors, and technical-administrative staff. This number is set to rise as students’ attention to sustainability grows. A survey carried out at the University (2017) shows that nine out of ten students say they are recycling and over 70% go to the University by public transportation. However, students do not feel a strong commitment from the University, as an institution, to sustainability. This is precisely the reason that led to the birth of i GREENtosi. This association wants to be a bridge between students and administration because students can be spokespersons for bottom-up ideas and sustainable changes.

² In the 2015, the Department of Management and Law of the Faculty of Economy successfully started the extra-curricular activity called ‘New Economy Labs’, a new training-action format capable to interest young students on the needs of their own territory/university and go through innovative ideas and projects in cooperation with local business, creating a bridge between science and society, with a view to generate shared value and sustainability development.

The young age of the association has not yet allowed it to define concrete projects, nor to verify its impact and repercussions on the University. Similarly, it is still difficult to evaluate the change of mentality at the University.

Goccia 'Goal One – Climate Change in Athenaeum'

Based on a project with MARIS Master³, the authors started an initiative aimed at combining a master's research with things that would impact the administration where we worked. The final goal was to make the University plastic-free, responding to the invitation of the RUS to reduce the consumption of disposable plastic and annual CO₂ emissions.

We reached our initial goal: to significantly reduce the consumption of bottled waters and provide a service that increases the well-being of the University community. It was thought that, in order to reduce the amount of plastic used on our campus, we needed to act by reducing the amount of bottled water consumed by those who are at the university daily.

To do this, it was necessary to have two tools: reusable water containers and drinking water certified and responsive to the needs of the University community. With regards to the 'container', it was thought that the problem could be solved by distributing stainless steel bottles: when you have a water bottle, you can fill it with water. But, in formulating a project that would respond to the concept of sustainability, we went a step further. To ensure the bottle was completely carbon neutral, we turned to a supplier who guaranteed compensation for carbon dioxide emitted during the production, packaging, and transportation through international projects and reforestation certificates. Therefore, each 500 ml water bottle filled with water contributes to reducing atmospheric carbon dioxide emissions by approximately 0.08 kgCO₂eq.

With regard to the second point, it was decided to offer a service that met the needs of the University community with the installation of purified water dispensers supplying smooth, sparkling and chilled water. To guarantee the quality, in collaboration with the Analysis and Process Certification Laboratory (LabCap) in the Department of Chemical Sciences and Technologies, water is periodically subjected to laboratory analysis and the results are published on the LabCap website.

During the 'Caccia al kWh' event⁴, 300 water bottles were distributed for free, and ten dispensers were installed among the macro-areas of Sciences and Letters and the Faculties of Medicine and Economics. Therefore, the project deliverables can be summarized as:

- stainless steel bottles distributed during the 'Caccia al kWh' event
- purified water dispensers installed in every macro area and faculty of the University

When a person has a reusable container and access to certified drinking water, the demand for water bottled in plastic containers should decrease, even if only to save the cost of purchasing water. The GOCCIA project's benefit to the University community is therefore evident as is the reduction in the use of plastic and the CO₂ emissions that came from it. In fact, just three months after the start of the project, important results have been achieved. After the 'Caccia al kWh' event, 800 bottles were sold, for a total of 126.381 liters of water dispensed and a reduction of 252.762 plastic bottles at the University⁵.

Table 1. Project results

Project start date: 28th February 2019			
Number of dispensers of water: 8			
	Liters of water dispensed	Number of bottles avoided	CO₂ emissions avoided (kg)
Economics	41.134	82.268	6.581
Literature	19.577	39.154	2.938
Science	45.204	90.408	7.233
Medical	20.466	40.932	3.275
Total	126.381	252.762	20.026

(Ludovici Pietropaoli V., Uttaro M.)

³ Master in Sustainable Development, Social Innovation and Commons, Social Accountability

⁴ Event to make students aware of responsible and sustainable behaviour

⁵ Data updated to July 2019

Conclusions and future purpose

Universities are experiencing a growing trend in redefining their strategies and organizations along the lines of sustainability (Beynaghi et al., 2016; Ferrer-Balas et al., 2010; Waas et al., 2010). Sustainability is seen not only as a component of education, research, and innovation but also as a social learning process within and beyond academia (Barth & Michelsen, 2013; Ferrer-Balas et al., 2009; König, 2015).

This study has shown how University 'Tor Vergata' has adopted sustainable development through the active participation of the academic community. In this way, not only the environmental impact and impact that University produces are realized, but also the role of individual actors is reconceived as 'multipliers of sustainability' (Calvano, 2017) in the places and environments of their lives, work, and society.

Both projects analyzed consider the threats and opportunities for concrete actions at the University. Although these two projects were born in different areas, they must not be viewed as detached but as integral to each other. The first lays the foundations for correct communication and information for the second.

As already specified, these are two projects that started at the university a few months ago. For these reasons, the effects and consequences are still not verifiable. This sets a limit on the case study that can be circumvented, in future research, through a survey on sustainable behavior among the entire academic community, with the aim to understand if the actions taken have an impact on the attitudes of those who live in University spaces on a daily basis.

The projects at the University of 'Tor Vergata' show how in the University, committed to sustainable development, is creating cultural change. This is because of a commitment that involves the entire University and where a key role is undoubtedly played by professors and administrative staff, but also where the commitment of students, called on to adopt sustainable behaviors and lifestyles inside and outside the University, becomes strategic. Awareness of the key role of students is what leads the University of 'Tor Vergata' to involve them in University sustainability projects that often take the form of 'system projects', not only sporadic events.

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