Supporting Grassroots-Led Initiatives in the Spanish Energy Field Through Transformative Education for Sustainable Development

Victoria Pellicer Sifres, Pau Lillo Rodrigo and Alejandra Boni Aristizábal

Abstract

This chapter aims to contribute to the reflection on the optimal way to encourage **stakeholder engagement for Education for Sustainable Development (ESD) in Higher Institutions (HI).** Firstly, we reflect on the role that higher education should play in the global transformation towards sustainable futures. Our goal is to contribute to a more critical framework for conceptualizing ESD—the "Transformative ESD"—which promotes deeper transformative processes to achieve sustainability within HI in comparison to more conservative approaches, and requires the inclusion and coordination of different stakeholders. Secondly, we propose several characteristics to develop a Transformative ESD processes at universities, integrating research, teaching and stakeholder's engagement. Thirdly, we present and analyse an experience at the Universitat Politècnica de València on the sustainable energy field, which was developed by the authors as researchers and teachers, through the engagement of three social organizations, during 2014 and 2015. This experience includes a broad range of activities: research, teaching, awareness raising and policy advocacy. The activities promote Transformative ESD in different terms: supporting sustainable grassroots-led

V. Pellicer Sifres (✉) · A. Boni Aristizábal
INGENIO CSIC-UPV, Universitat Politècnica de València, Camino de Vera s/n, Valencia, Spain
e-mail: vicpelsi@ingenio.upv.es

A. Boni Aristizábal
e-mail: aboni@dpi.upv.es

P. Lillo Rodrigo (✉)
Local Development and International Cooperation Ph.D. Programme, Universitat Politècnica de València, Camino de Vera s/n, Valencia, Spain
e-mail: palilrod@upvnet.upv.es

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initiatives; questioning the current energy system (ES) and analysing its dramatic consequences (i.e. high levels of fuel poverty); proposing a new one more sustainable and fairer; and promoting energy savings and efficiency, renewable energies, energy sovereignty and democratisation. The main findings of our research show us that encourage stakeholder engagement in a Transformative ESD process at universities implies considering a multi-stakeholder and an interdisciplinary team. Moreover, the process should be implemented from a participatory approach, based on the establishment of meaningful relationships between HI and citizenry, and should promote social transformation towards sustainable futures.

Keywords
Higher education · Sustainability · Critical framework · Energy · Grassroots-led initiatives · Participatory approach

1 Different Approaches to Sustainability in Higher Education

Various debates exist on the role public university plays in our society and the role it should be playing. Several theories characterise the aims, functions, mission and practices of universities, in terms of teaching, researching and community engagement.

Currently, as Bessant et al. (2015) remark, the most widespread ideology is that of neoliberalism, which is based upon the principles of economic liberalisation and decentralisation (free trade, open markets, privatisation, deregulation and decrease in the welfare role played by state). It also has significant implications for the vision and mission of education in general, and Higher Education (HE) in particular.

In this sense, with reference to universities, neoliberalism has contributed to a highly competitive higher education set-up, as universities are becoming evermore fiscally focused, businesslike and managerialist, and we are witnessing some huge transformations concerning the purpose, mission and framing of higher education (Bessant et al. 2015). The changing direction of university strategic plans and policy priorities towards increased income generation, innovation, commercial enterprise, business engagement and, indeed, the advent of university 'corporate' plans highlight this change (Jary 2005; Marginson 2007; NEF 2008; Streeting and Wise 2009; McArthur 2011 as cited in Bessant et al. 2015).

However, HE has been extensively studied and criticised for undermining its core values by choosing to uphold the neoliberal ethos and for the consequent inevitable trade-offs with other values such as social justice, equity, environmental protection and ethical and democratic decision-making (Devaney and Weber 2003).

In the 30th anniversary edition of his seminal work, 'Pedagogy of the Oppressed' (Freire 1970), Richard Shaull closes the foreword of the book with the following words:

> There is no such thing as a neutral education process. Education either functions as an instrument which is used to facilitate the integration of generations into the logic of the present system and bring about conformity to it, or it becomes the 'practice of freedom', the means by which men and women deal critically with reality and discover how to participate in the transformation of their world (Shaull 2006).

(McArthur 2011) explores these critical issues in depth. She states that *'such a change suggests that higher education is primarily seen as a tool that contributes to the achievement of other primary goals – namely business, innovation and skills – rather than a priority in its own right'*.

The Sustainable Development (SD) approach entails this transformative concept towards education in general and HE in particular. As (Leal Filho 2015) explains, SD should pursue the attainment of values of care, peace, truth, justice, tolerance and kindness (CEE 2007 cited in Leal Filho 2015). From this perspective, different reflections are presented about what role higher education should play in the global transformation towards sustainable futures (Beringer and Adomßent 2008), and which groups of stakeholders should be involved. In accordance with this, the present chapter supports the following idea related to Sustainability in Higher Institutions:

> HE's fundamental responsibility towards sustainability is espoused on many grounds, including its critical role as a societal leader, future shaper and exemplar of best practice, its influence on local and national policy, and its role in educating the next generation of global citizens (van Weenen 2000; Corcoran and Wals 2004; Gough and Scott 2008 as cited in Bessant et al. 2015).

In the following section we will expand this idea of SD in higher studies, focusing on the realm of Education from a critical framework.

2 Transformative Education for Sustainable Development in Higher Education

The concepts of SD and of education as being imperative in the drive towards sustainability, were largely born out of two key events: the United Nations World Commission on Environment and Development in 1987 and the United Nations Conference on Environment and Development in Rio de Janeiro 1992 (Leal Filho 2000). Both reports concluded that ecological and social failures showed common causes and thus required common responses (Kemp et al. 2005).

Since then, a multitude of literature has been written about the concept of SD. Recent evidence suggests that the implementation of SD projects has to be focused not only on the economic and environmental dimensions, but also on a social dimension (Froger et al. 2004). This is driven by an increasing awareness that sustainability problems cannot be solved solely by scientific knowledge (Selman

and Parker 1997), and consequently local and expert values have to be considered, through the engagement of an interdisciplinary group of stakeholders.

With reference to this, the concept of Education for Sustainable Development (ESD)—a central issue in the realm of SD—is commonly defined as follows:

> ESD is a vision of education that seeks to balance human and economic well-being with cultural traditions and respect for the earth's natural resources. ESD applies transdisciplinary educational methods and approaches to develop an ethic for lifelong learning, fosters respect for human needs that are compatible with sustainable use of natural resources and the needs of the planet and nurtures a sense of global solidarity (UNESCO 2002).

Focusing on ESD in Higher Institutions (HI), the international mandate to make universities and colleges lead partners in global sustainability efforts has resulted in a flurry of activities and initiatives both in public policy as well as in practice. As Beringer and Adomßent (2008) indicate, different types of sustainability in HE projects may be discerned on a spectrum, where the 'traditional' (…) *greening the campus initiatives* are: the projects, campaigns, initiatives (paper-cut campaign, curriculum reform to include more sustainability content) that seek to change one or a limited number of operational or academic aspects. At the other end we find sustainable university research and development projects (…) which seek institutional transformation for a dual purpose: institutional improvement in terms of sustainability, and the progress of science and generation of knowledge.

We will follow the second approach, and make the case for a "Transformative ESD". As Bessant et al. (2015) remark, Transformative ESD requires more radical and fundamental change, which goes beyond 'integrating', 'embedding' or 'mainstreaming' sustainability within HE. Consequently, calls have been made for a more transformative system that places sustainability at the heart of HE's 'raison d'être' (Sterling et al. 2013): *"an epistemic and paradigmatic reorientation of universities towards sustainability which fundamentally changes the make-up and ideology of the system itself"*.

Transformative ESD recognises the importance of engaging different groups of stakeholders committed with ESD, since it has significant benefits. As Barnes and Phillips (2000) indicate, *"partnerships can enable a whole variety of practical outcomes, by-passing the sterility of many traditional approaches to academic work. (…). Contributions from academics and practitioners (…) can help to ensure they combine academic rigor with grounded applied objectives"*. From this partnership approach, local knowledge proceeding from social organizations and civil society is also considered and valued, and it complements scientific-rational knowledge, generally created at HI.

Accordingly to this, in this chapter we reinforce the idea that Transformative ESD in HI is not only a matter for researchers, teachers or students, but also for civil society, social organizations, and other actors such as private sector or other public sectors (administration departments, etc.).

3 A Comprehensive Approach to Transformative ESD

The previous literature reviewed has highlighted the urgency of educating university students from a Transformative ESD approach, in which research, teaching and community engagement are driven so as to encourage students to be critically engaged with sustainability issues as well as equipping them with the skills to contribute towards a more sustainable future. What's the role of research and teaching for it? How different stakeholders could be engaged? How it could be linked with a Transformative ESD approach in higher education?

For one side, with reference to research in ESD, Bessant et al. (2015) point, that it is essential in order to understand the successes and challenges of the role of educating for a sustainable future, and to drive sustainability activity in institutions.

An interesting approach to ESD research is proposed by Robottom and Hart (1993):

> […] one which includes consideration of both human consciousness and political action and thus can answer moral and social questions about educational programs which the dominant form [research paradigms] cannot. It is one which is more consistent with the ecophilosophical view – which encourages individuals to be autonomous, independent critical and creative thinkers, taking responsibility for their own actions and participating in the social and political reconstruction required to deal intelligently with social/environmental issues within mutually interdependent and evolving social situations (Robottom and Hart 1993 quoted in Fien 2002).

This approach is linked with the idea of Transformative ESD, since it is based on core values such as justice, critical thinking, environmental ethic and democratic participation. According with this, Beringer and Adomßent (2008) explain that "*sustainable university research speaks to the issue of ethics (responsibility and accountability) and aims to generate not only cognitions and technical expertise, but also ethical knowledge*" (Donner and Weiß 2000 as cited in Beringer and Adomßent 2008). From our perspective, these ideas also apply to teaching and community engagement, thus creating a comprehensive framework within Transformative ESD.

Considering initiatives to promote stakeholders engagement, there are several different techniques and strategies that are generally used. Nevertheless, there are some transversal elements to be considered in these processes, such as the establishment of meaningful relationships or fostering existing ones, willingness to learn about the aims and activities of local organizations, consideration of potential mutual interests and benefits areas, and careful consideration of the needs of the organization (Barnes and Phillips 2000).

Within this spectrum, this chapter presents a proposal with some elements for implementing Transformative ESD, integrating research, teaching and stakeholder's engagement. These proposed elements are structured into three parts: the first one defines the actors engaged with a Transformative ESD initiative; the second one suggests characteristics and strategies for implementing it; and the third one indicates the goals and objectives sought (Fig. 1).

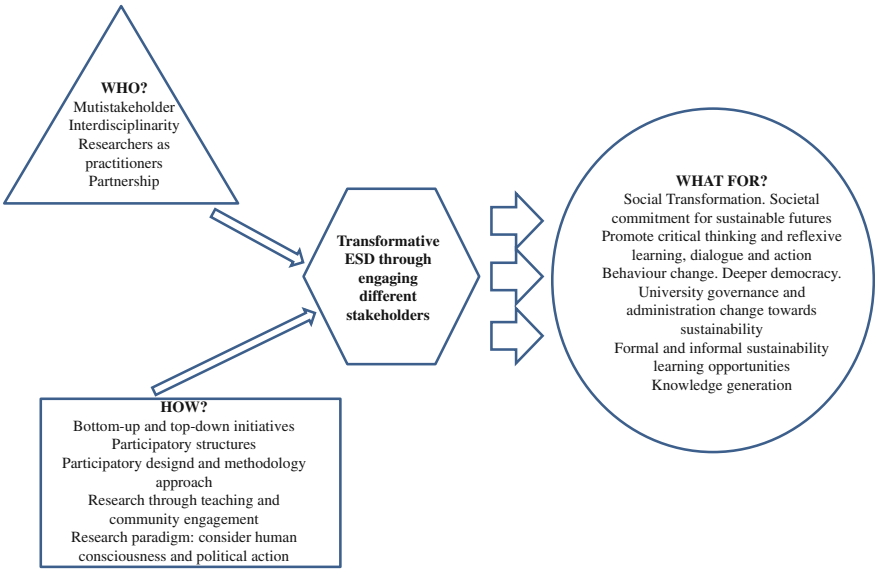

Fig. 1 Elements for implementing transformative ESD

Regarding the first part—"**WHO participate in the Transformative ESD initiative**?"—various authors highlight these elements:

- **Multi-stakeholder approach**: Sustainable university projects rely on multi-stakeholder processes and engagement, both within the internal campus community as well as with external parties (Beringer and Adomßent 2008; Barnes and Phillips 2000; Moore 2006).
- **Interdisciplinary approach**: Knowledge of other disciplines, their world-views and methodologies. Mutual respect for roles of disciplinarians and generalists. Ability to work together in teams and use interdisciplinary frameworks to integrate knowledge (Sherren 2008; Moore 2006).
- **Duality in role and responsibilities**: The researchers and the researched are one and the same. Its researchers are also its practitioners; the researcher-practitioner cannot separate her-/himself from the effects or implications of her/his research, as in many other forms of science (Beringer and Adomßent 2008).
- **Partnership approach**: Benefits arise through partnership work between higher education institutions and other local organisations in the environmental sector (Barnes and Phillips 2000).

Concerning the second part—**HOW is Transformative ESD implemented?**—the main issues identified are:

- Combine **'bottom-up'** campaigns with **'top-down'** policy initiatives, to exploit the synergies for sustainability that exist when the two subsystems of

management/operations and academe are respected as holons within a larger system (Beringer and Adomßent 2008).

- Design **participatory structures**, for instance via multi-stakeholder processes or two-way dialogues, to enable democratic communication between researchers and the researched—toward high levels of acceptance, buy-in and engagement, for on- and off-campus community members (Tormey et al. 2008; Froger et al. 2004).
- Implement **participatory design/methodology/approach**, for instance Action Participatory Research (based on a cyclical process of action, observation, reflection and adaptation) (Tormey et al. 2008).
- Integrate **research, teaching and services,** due to the necessity of implementing more suitable approaches, instead of the traditional single disciplinary approaches where research, teaching and services on innovation for sustainability need to be systematically linked (Moore 2006; Posh 2014).
- Adopt a **research paradigm** which includes consideration of both human consciousness and political action (Fien 2002; Sherren 2008).

Finally, the third part—**WHAT is the purpose of a Transformative ESD?**—the main goals envisioned are:

- That it is conceived in service of **social transformation**. To seek to realise its **societal commitment for sustainable futures**, by seeking to influence state/provincial, national and international public and educational policy as well as the higher education system/s toward preferred, more sustainable alternatives (Beringer and Adomßent 2008; Bessant et al. 2015; Devaney and Weber 2003).
- Create spaces for pedagogical transformations, promoting **critical thinking** and **reflexing learning**; **dialogue** and **action** (Moore 2006).
- Complement technical and behavioural sustainability interventions, and use **behaviour change methods** (Caners 2006 as cited in Bessant et al. 2015), since *"environmentally sensitive behaviour starts with individuals having an understanding of the consequences of their behaviours (knowledge)"* (Too and Bajracharya 2015).
- Work towards cementing sustainability principles in **university governance and administration;** and on HE policy level (Bessant et al. 2015; Sherren 2008; Froger et al. 2004).
- Offer **formal and informal sustainability learning opportunities** on campus and reflect on its curriculum and teaching (Barth 2013).
- To be **committed to knowledge generation**, to contribute to a clearly definition of sustainability (Owens and Legere 2015), knowledge transfer and capacity-building for sustainability, as evidenced in publications, conference presentations, and community-based dissemination strategies (Beringer and Adomßent 2008; Posh 2014). If an institution desires to instill the next generations with a firm understanding of sustainability, then they must define it for themselves and express this definition clearly to their populations. Sustainability has far too many proponents with a range of at times opposing goals to allow its definition to be left to creation by mélange. What it is up to the administrators and educators at IHEs to determine whether an expansive yet muddy

understanding of sustainability is sufficient for their own goals of creating an educated citizenry.

4 Supporting Grassroots-Led Initiatives in the Energy Field Through Transformative ESD

The Spanish Energy System (ES) is widely considered to be unfair and unsustainable for various reasons, such as centralised power and benefits, lack of competitiveness (oligopoly), huge economic deficit, weak accountability and answerability, revolving doors, etc., which have produced a significant impact on Climate Change and high Fuel Poverty rates (Lillo and Pellicer 2014).

In this context, Universitat Politècnica de València (UPV) has promoted and supported grassroots-led initiatives in terms of ESD, aimed at achieving a new, fairer and more sustainable ES, including energy savings and efficiency, renewable energies, energy sovereignty and democratisation.

On the basis of the diverse strategies defined in Sect. 4, several activities have been carried out to achieve these goals, which are described subsequently.

Considering academic **research**, there is one project funded by the Government, aimed at analysing grassroots initiatives against Climate Change, and 2 Ph.D. theses which are principally characterised by being linked to the problems caused by the current ES in Spain. This research, together with further activities described below, is being developed together with grassroots organisations that are working to transform the ES, such as the Platform for a New Energy Model (a partnership of environmentally-committed collectives), Som Energia (a non-profit green energy cooperative) and Engineering Without Borders (a development NGO). As an example of the outcomes of these activities, two research articles have been published, reflecting upon the influence of the Spanish ES on Fuel Poverty and the role of the citizenry in changing it (Lillo and Pellicer 2014) and contributing to and promoting the debate surrounding the conceptualisation of Fuel Poverty in a wider theoretical framework, focusing on people's freedoms: the Human Development approach (Pellicer and Lillo 2014).

Regarding **knowledge diffusion and teaching**, several activities have been performed lately. Firstly, Sustainable Development seminars have been established in the Master in Cooperation for Development at UPV, to analyse and discuss different views on Fuel Poverty, its causes and effects, and which strategies might be used to diminish and ultimately prevent this problem in Spanish society. Secondly, within the course named "Green skills for boosting transitions", organised by Climate-KIC[1] at the UPV, the authors presented the successful case of Som Energia, a non-profit green energy cooperative that aims to promote change in the Spanish ES towards a 100 % renewable energy system. Thirdly, within a Climate-KIC Alumni assembly in Valencia, the authors prepared a workshop on the

[1]An important European public-private innovation partnership.

Spanish ES, its main characteristics, advantages and disadvantages on the basis of the Sustainable Development approach, and what the strategies to address the problems should involve. Finally, as part of the Solar Photovoltaic Energy diploma at the university, three special workshops were organised by the Platform for a New Energy Model, together with the authors, to discuss Fuel Poverty, Fracking and the Spanish Energy Market. In the first, we discussed the concept of Fuel Poverty and the consequences this problem has on people's lives. We analysed the factors that are provoking increasing rates of Fuel Poverty and discussed possible solutions to the current situation. In the second, we described the impact this practice might have on the environment, what the current pattern of energy mix in the world is, and what alternatives would be feasible to achieve a shift to a 100 % renewable energy system. In the third, we presented how energy prices are established in Spain, described and analysed the energy laws and regulations, and analysed their consequences on renewable energy development.

Regarding **policy advocacy initiatives**, the UPV hosted and funded the Energy and Environment Forum 2015, organised by the authors and the Platform for a New Energy Model, where political representatives of the 7 main political parties debated their energy and environment proposals for the new legislature in Valencia (Spain). This event included a space where the citizenry could present doubts and proposals, and discuss them directly with the politicians. In this way, the UPV contributed to creating a new political model, one in which the wills and opinions of the citizenry can be directly addressed to decision makers, thus strengthening the democratic processes (Fig. 2).

Fig. 2 Initiative of transformative ESD in UPV

5 Discussion

The case study analysed exhibits most of the elements presented in the first four Sections, hence it allows us to proceed with the discussion on how Transformative ESD should be carried out at universities.

Next, we analyse the most significant key points of the case study, focusing especially on WHO participates in the initiative, HOW it is implemented and WHAT it is for.

5.1 Who Participates in the Transformative ESD Initiative?

This initiative has been developed in coordination with **diverse stakeholders**, thus strengthening partnerships. One of the key elements that catalyses the interaction between different stakeholders (university and the citizenry) is the fact that university members are part of the organisations involved and actively participate in their assemblies. From this position, authors as researchers question their responsibility in the current ES and—understanding that they are also practitioners—they are committed to bringing this organisation into closer contact with the university.

Moreover, this Transformative ESD initiative can be considered as **transdisciplinary**, as it explores the link between Energy and Society. Not only has it delved into technical issues, such as fracking or renewable energies, but also into the social impacts of the ES. Transdisciplinarity has promoted the participation of multiple stakeholders, i.e. technicians, seniors, activists, sociologists, etc. Hence it has enabled the scope to be broadened, raising consciousness of diverse sectors of the civil and university population about the urgency of changing the current Spanish energy system.

Nevertheless, this example shows the internal departments, i.e. environment, infrastructure or cooperation for development areas, have difficulties in engaging and working together on this kind of activities with stakeholders who do not belong to the university. In fact, in this case the relationship between them has been instigated by the researchers, but close and lasting links between them have not been achieved yet. Different organisation schemes, goals and approaches have proven to be significant barriers to working together, but overloaded agendas and schedules have also hindered a robust collaborative process.

5.2 How Is Transformative ESD Implemented?

This methodology has a **bottom-up approach**, as it is aimed at answering social claims not defined by the UPV itself, but by grassroots initiatives. Moreover, the methodology used in all activities is based on **participatory principles**, as the design, implementation and discussion of results are shared with all the

stakeholders involved. Nevertheless, it cannot be considered as Participatory Action Research because the core research is carried out by members of UPV.

This case study shows the **link between research and teaching**, in addition to presenting a clear example of university **commitment engagement** in ESD. However, evidence shows that this approach is only used in specific, isolated activities, which are not structured nor completely included within the university educational plans. Hence, ESD teaching might potentially be used only in spaces where people involved are already aware of the need to deal with sustainability approaches, i.e. a Masters Degree in Cooperation for Development, thus limiting its transformative potential.

5.3 What Is the Purpose of a Transformative ESD?

Transformative ESD activities, based on the **critical paradigm**, aim to promote social consciousness, as well as to **contribute to policy advocacy**. In this sense, the use of the Human Development approach, which was never used in this kind of analyses in the past, has been a key element to enable these goals to be reached. Hence, the research projects have also contributed to the generation of knowledge, adding a **new successful theoretical-conceptual framework** to the current discussion on sustainability for development in Spain. The diverse actions carried out have also promoted **critical consciousness** with relationship to the influence of the energy system on society, presenting feasible alternatives to reach **social**

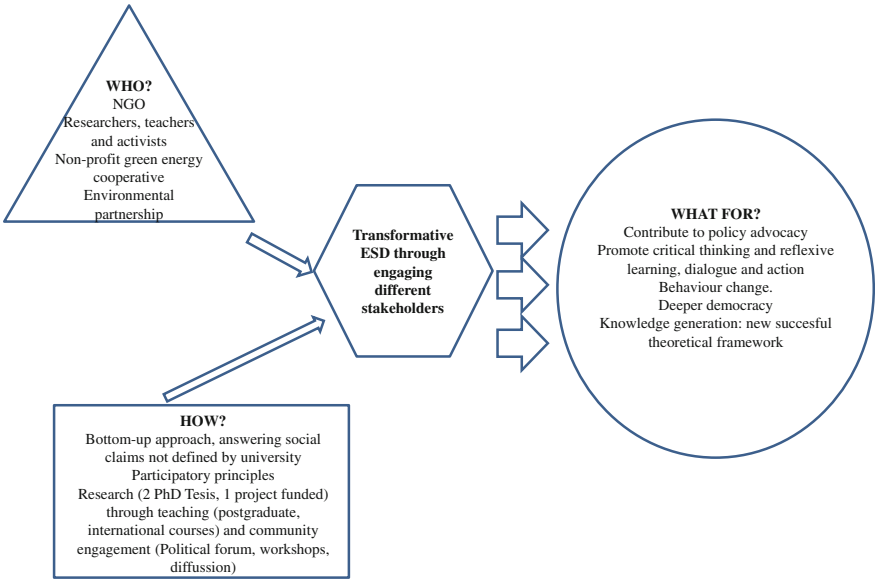

Fig. 3 Elements of transformative ESD initiative in UPV

transformation, such as energy consumption options, strategies to prevent Fuel Poverty or participatory spaces for **deeper democracy**. As presented in Sect. 4, this should be one of the goals and responsibilities of public universities.

However, regarding university governance, UPV is not building a transformative strategy towards sustainability. Bottom-up strategies, such as the one presented above, should be combined with top-down ones, thus engaging decision makers to establish new policies, regulations, internal structures, etc., in order to have a greater and more sustainable impact (Fig. 3).

6 Conclusions, Limitations and Recommendations

From our perspective, HE should contribute to the achievement of broader and deeper goals than those related with neoliberal paradigm (business, innovation, skills…) by focusing on promoting core values such as justice, equity, environmental protection, democracy, participation and critical view. In this sense, HE has a clear responsibility towards the promotion of sustainable futures, considering the participation of different stakeholders.

To look into this view of HE, this chapter has proposed several characteristics to develop transformative ESD processes at universities.

Firstly, concerning the actors WHO participate, we propose to consider a multi-stakeholder team, not only considering various parties in the internal campus community but also the external ones, such as local organisations or civil society. Moreover, it is interesting to establish an interdisciplinary team, so as to create knowledge from different disciplines and parties. Within this multi-stakeholder and interdisciplinary team, it may result the case that researchers and researched are the same (researchers-practitioners). Secondly, regarding the process about HOW Transformative ESD should be implemented, the main issues proposed are to combine bottom-up campaigns with top-down initiatives; to create participatory structures so as to co-design the research and to integrate teaching tasks and community engagement. Lastly, relating with WHAT is the purpose of a Transformative ESD, the main goals envisioned have to do with social transformation towards sustainable futures: promote critical thinking and reflexive learning; facilitate behaviour change; cementing sustainable principles in university governance and administration; offer formal and informal sustainability learning opportunities; and be committed to knowledge generation.

These elements have been analysed in a case study at UPV, which considers research activities, teaching, diffusion, increasing sensitivity and policy advocacy regarding promotion of sustainable energy systems in Spain.

Our analysis confirms the relevance of including groups of civil society in the initiative presented in order to achieve significant benefits on behalf of sustainability, according with bottom-up initiatives. Consequently, university, which is a public institution aimed at serving society, is working for answering social needs. In our case, this was possible due to the fact that researchers were at the same time

practitioners, what make evident the importance of the establishment of meaningful relationships, based on trust, respect, recognition and mutual purposes.

Next, this experience is based on a participatory approach, thus stakeholders engaged are involved in all phases: discussing the purposes of the research, disseminating results, participating in teaching spaces and preparing the activities of policy advocacy. On one hand, this process empowers and reinforces social organizations. On other hand, it implies to coordinate all stakeholders with different rhythms, agendas and functioning.

Furthermore, working with groups from social organizations with a lot of experience on the work in the energy field has contributed to the existent debates at university from a critical and activist perspective. This has strengthened the idea of social transformation towards sustainable futures. Additionally, this engagement helps to legitimate those social organizations involved, in front of the society in general.

Nevertheless we are aware of the limitations of this experience, which are mostly related to the difficulty of driving changes in university governance, so as to cement sustainability principles. This requires a long term strategy, coordinated with other areas and departments in university, with a direct link with university responsible of developing sustainable policies. Our bottom-up initiative has not been combined or connected with other top-down policy initiatives, which would have been significantly interesting so as to exploit the synergies and extend the impact. Moreover, the fact that researchers are practitioners as well implies the existence of a bias during the research process.

Considering the lessons learned from the case study and taking into account the limitations of this research, we propose several elements that should be considered in future processes in order to achieve Transformative ESD goals, such as: the inclusion of different stakeholders in an interdisciplinary team, with special links and a collective identity; impulse of grassroots-led participatory processes, which should be designed through the dialogue; considering the wide spectrum of agendas, rhythms and interests; considering social demands and combining them not only with research activities, but also with teaching and services; promotion of initiatives to raise critical consciousness, reflection, changes in habits, attitudes and governance models within universities; an looking for alliances in various areas in the institution in order to combine bottom-up initiatives (with stakeholders from civil society) with top-down policy initiatives (with stakeholders from the level of management in HI).

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Author Biographies

Victoria Pellicer Sifres Research Assistant at INGENIO (CSIC—UPV) a joint research institute of the Spanish National Research Council (CSIC) and the Polytechnic University of Valencia (UPV). Degree in Industrial Engineering (2007, UPV and École National d'Arts et Mètiers Paris); M.Sc. in Policies and Process of Development (2010) and M.Sc. in Development Aid (2013). Ph.D. candidate on Local Development and International Cooperation (UPV). Fields of interest: grassroots social innovation; human development; critical perspectives of climate change; energy democratization.

Pau Lillo Rodrigo Ph.D. candidate on the Local Development and International Cooperation at Universitat Politècnica de València (UPV). Degree in Industrial Engineering (2007, UPV); M.Sc. in Development Policies and Processes (2011, UPV); M.Sc. in Mechanical Engineering and Materials (2011, UPV); M.Sc. in Renewable Energies Engineering and Management (2014, Universitat de Barcelona); Univesity Specialist in Solar Photovoltaic technologies (UPV, 2014). Fields of interest: human development; renewable energies; grassroots social innovation; climate change.

Alejandra Boni Aristizábal Associate Professor at the Universitat Politécnica de València. Research at INGENIO Institute. Visiting professor and invited lecture in several universities and research centers (Europe, North and Latina America). Honorary Professor of the University of the Free State in South Africa. Co-authored more than 30 referred papers in the field of development studies and higher education. Co-editor of the book *Universities and Human Development. A New Imaginary for the University of the XXI Century (*Routledge, 2013). Associate Editor of the Journal of Human Development and Capabilities and co-convenor of the thematic Education Group of the HDCA.