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A Conceptual Model Proposal: Universities as Culture Change Agents for Sustainable Development

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Abstract: This paper aims to propose a conceptual model that synthesizes the existing findings concerning universities as culture change agents for sustainable development. The model could serve as a guidance on how universities might get involved in the pro-SD activities. It also underlines the prerequisite of the quality culture that should be introduced within all the activities of universities to successfully act as culture change agents for SD. This paper builds upon the holistic and inter-disciplinary approach to demonstrate that SD does not happen in isolation and that the role of universities in its creation is significant. This study includes a literature review to contextualize the impact of universities on culture and their potential role in SD. The conclusions stemming from the literature review materialize in the proposal of the conceptual model of the university as the culture change agent for SD. The elaborated framework responds to the need for greater clarity, ordering and systematization of the role of universities in the processes of initiating, promoting and modelling the SD-oriented changes while appreciating the role of culture as an enabler, means of social change and a result of SD-focused interventions. The paper contributes to the body of knowledge by offering a novel perspective on the assumed interrelations between university, its quality culture, university main operations such as education, research and engagement with the society as well as the culture and the agency of stakeholders in the context of meeting the world's current demands without compromising the needs of future generations.

Keywords: universities; culture; sustainable development; quality culture; change agent; model

1. Introduction

Universities have the potential to foster sustainable development [1]. Given their primary function as the incubators of knowledge, research leaders and the partners to the social and business world that surrounds them, they play an important role in the creation of the society culture: peoples' core assumptions, values, beliefs and artefacts that translate into actions which lead to particular effects and may positively or negatively relate to the creation of sustainable development. Therefore, universities through all their three missions: teaching, research and service to society, and also by setting themselves as an "inspiring example" in the everyday operations, influence the society's culture and actions of its members thus serving as a powerful means to help create a more sustainable future.

Culture matters in sustainable development. Many if not all of the planet's environmental problems and certainly all of its social and economic problems have cultural activity and decisions at their roots [2]. Culture shapes personal identity and determines the way the world is seen. No development

can be sustainable without including culture [3]. Nowadays, sustainability is widely debated and conceptualized in numerous ways [4–10]. If achieving sustainability is first and foremost about making appropriate use of the planet's resources, then culture should remain at the center of development strategies, since cultures condition people's behaviors and frame people's relationship to others in their society and the world around them, including the natural environment [3]. The interconnections between sustainable development and higher education have been widely studied and contributed to the development of a well-established field of research. Findler et al. [11] systematically reviewed the existing literature on impacts of higher education institutions (HEIs) on SD. They concluded their analysis indicating a need for a holistic perspective that considers the impacts of HEIs on SD. The authors indicated also that cultural impact of HEIs on SD and its implications for the policy are currently underexplored and require further attention. It is also important to highlight that many studies on SD in universities refer to the Sustainable Development Goal (SDG) number 4 [12] concerning inclusive and equitable quality education and promoting lifelong learning opportunities for all [13–16]. However, few of the papers present in a holistic and integrated way the influence that the university may have on SD. Moreover, the majority of research concerning universities and SD also do not focus on the culture factor although history has shown that culture plays a significant role in fostering and maintaining sustainability [17] and universities are the institutions that impact the culture of the societies. Therefore, this paper aims to address this gap and offer an integrated framework viewing universities as culture change agents for sustainable development.

Sustainable development results from the actions and interventions that bring particular effects together and are dictated by the core assumptions, values, beliefs, and artefacts. Culture may be created and modified by the universities through the implementation of their main missions that should take into account the SD challenges.

The paper's organization follows the logic of the research process. The introduction is followed by the analysis of relevant theories and definitions to build foundations for the study. Then, the methodology section describes the research protocol adapted for the study. The following sections follow the research plan and include a part that highlights the role of the universities as culture change agents for SD and a section referring to how the quality culture of universities can support SD and become a building block for a university to become a role model in supporting SD. The analysis also encompasses a section on how SD can be supported by the universities' main areas of operations: teaching, research and serving the society. The proposed novel model of the universities as culture change agents for SD follows the analysis part and offers the synthesis of the identified variables relevant for the context of the study. The paper finishes with conclusions addressing the implications and the limitations of the study.

The novelty of this paper stems from contributing to the body of knowledge by synthesizing the existing findings and proposing a novel conceptual model which presents the perceived interconnections between universities and SD. Conceptual frameworks aim to clarify and relate concepts to make them useful tools in research through description or categorization [18]. Therefore, the proposed model could serve as a guidance for academia and public policymakers on how the higher education institutions might get involved in the pro-SD activities while fulfilling their missions. What is more, the results of the paper highlight university quality culture as the condition for a university to become a role model and act as a culture change agent for SD in the society, which adds to the discussion on the importance of enhancing quality in university operations to create impact for SD. Lastly, the study builds upon the literature from sociology, education, management thus offering an interdisciplinary perspective on the phenomenon under investigation.

2. Theoretical Basis

This section offers the definitions of the key concepts applied in the study as well as the theories that guided the study protocol and inductive reasoning applied for the development of the conceptual model. The most common definition of a university describes it as a specialized institution whose core

business is knowledge, its production, reproduction and dissemination [19]. Jongbloed, Enders and Salerno [20] state that the power of universities to society could be analyzed as a level of the higher education institutions' commitment to its stakeholders. Stakeholders are actors—organizations, agencies, clubs, groups, or individuals—who may gain or lose from an organization's activities [21,22] with interest ("stake") in the organization's performance. Stakeholders are defined as "any group or individual who can affect or is affected by the achievement of the organization's objectives" [23] or as those who have an interest in a particular decision or course of action, either as individuals or as representatives of a group [24].

Given all the roles the universities play for the regions and countries the universities are in a unique position to influence the culture in which they operate and the agency of the society members.

There is an abundance of definitions of culture proving how complex and difficult to describe this concept is. For this study, the authors decided to apply a definition that presents culture as a holistic phenomenon: "(. . .) the whole complex of distinctive spiritual, material, intellectual and emotional features that characterize a society or social group. It includes not only arts and letters but also modes of life, the fundamental rights of the human being, value systems, traditions and beliefs" [25]. This definition links three key meanings of culture: firstly, culture understood as a way of life encompassing the underlying assumptions, values, beliefs, traditions; secondly, culture as an equivalent to art, including the process and result of the creative activities; thirdly, culture as a system of symbols that convey meaning. Such a complex understanding of culture shows the potential that lies in this phenomenon, how fundamental and crucial it is for all human beings.

One of the most widely recognized definitions of sustainable development (SD) is that of the Brundtland Report [26] from 1987 that defines SD as "a development that meets the needs of the present without compromising the ability of future generations to meet their own needs". This definition has also been adopted more generally as a definition for sustainability. Sustainability is seen as a paradigm for thinking about the future in which environmental, societal, and economic considerations are balanced in the pursuit of an improved quality of life. (. . .) Sustainability is thought of as a long-term goal while sustainable development refers to the many processes and pathways to achieve it [4].

Culture plays an important role in the context of sustainable development. It can be regarded as [2]:

- "culture in sustainable development"—culture can form a self-standing fourth pillar of sustainable development, next to ecological, social, and economic dimensions. Such a position reveals its autonomous role, highlights its significance, but at the same time it creates a risk of being understood quite narrowly, mainly in the sense of arts and creative activities, for example, related to protecting assets deemed cultural that are valued;
- "culture for sustainable development"—culture can play a connecting and mediating role for all the three economic, social, and ecological pressures and needs. It penetrates the lives of all human beings, therefore, its omnipresence can guide sustainable development by balancing and connecting the three dimensions. In this role, culture becomes a driver of change;
- "culture as sustainable development"—culture can be seen as an essential foundation and structure for achieving the aims of sustainable development. In this role, it integrates, coordinates and guides all aspects of sustainable actions. By playing the holistic and transformative role it creates sustainability.

The three presented roles of culture in the context of sustainable development recognize the concept of culture as a key enabler for sustainability. In this study, the authors focus on the second role of culture, namely "culture for sustainable development". Cultural rights, heritage, diversity and creativity are core components of human and sustainable development [27]. It is important and necessary to explicitly integrate culture in sustainability discourse, as achieving sustainability goals essentially depends on human accounts, actions, and behavior which are, in turn, culturally embedded [28].

Culture plays an important role in promoting sustainable development [29]. Universities can become the cultural change agents for sustainable development by applying two paths. The first one leads to SD through the internal change of university culture that recognizes SD as a goal and aims at assuring the adequate quality of operations, thus influencing the HEIs' stakeholders through setting examples and becoming the role models in adhering to sustainable development principles. The second one relies on the effects that higher education can achieve on the university stakeholders through its three major functions: teaching, research and broader societal engagement. Both paths will be further discussed in the next sections of the paper.

The sustainability development discourse may be analyzed at the normative (what should we do?), the operative (what can we do?) and the descriptive (what is true?) levels [30,31]. Following the description of the basic understanding of "sustainability science" presented by Jahn [32] in this paper all three levels of SD discourse are referred to. At the normative level, the settings of what is societally desirable (culture change for SD) are presented, together with underlining paths to achieve this scope. On the operational level, the references to the necessary process (actions) are indicated. At the descriptive level context, conditions and the main relations are described.

The theoretical foundations of the analysis presented in the paper are based on several theories that form a basis for sustainable development. The most general and basic theory that gives foundations to this research is the social contract theory [33,34]. This theory expresses the view that persons' moral and/or political obligations are dependent upon a contract or agreement among them to form the society in which they live. It will be referred to in the context of university faculty and leadership who aim at serving "the public good". The most significant theory that was used as a basis of the presented analysis is the "Orientor theory" that was developed by Bossel [35] in order to find universally valid answers to the questions of how scenarios, policies and development paths in evolving systems could be evaluated, and how sustainable strategies and management approaches could be identified. This theory permits identifying sustainable conditions, i.e., permanently sustainable arrangements of a dynamic co-evolution of the system and its environment [36,37]. Other theories refer to stakeholder relations management. They analyze various groups that could affect an organization and could be affected by an organization. Adopting stakeholder relations management theories to the environmental dimension of sustainable development means to rethink the nature of universities' environmental impacts and the managerial tools adopted by them [38]. The model presented in this paper refers to changes that may be necessary in the universities to introduce quality culture leading to SD, therefore the theory of change is also applicable for the considerations. The theory of change defines long-term goals and then maps backward to identify necessary preconditions. It outlines causal linkages in an initiative and indicates outcomes. The identified changes are outlined—as the "outcomes pathway" [39].

Analyzing theories that lay foundations to SD studies, Parodi [40] underlines that cultural aspects and the cultural perspectives continue to be neglected in theoretical/scientific debates over sustainable development and he adds that "a thoroughgoing and comprehensive addressing of the cultural perspective in scientific theories and concepts regarding sustainability would open up better–more forceful, more accurate–theories, and other, further-reaching and better, options for implementation, as well as new qualities for sustainable development". He also states that "massive lack of cultural-theoretical and cultural-scientific component in the conceptual debate" around SD may be identified. Contemporary cultural theory fundamentally views culture in the context of the collective and the individual, explaining that sustainability is an individual matter while sustainable development is a cultural process, hence, there is an interplay between the collective and the individual [40]. As well, university can play an important role in this interaction.

3. Methodology

This study aims at synthesizing the existing theoretical and empirical findings concerning universities as culture change agents for sustainable development. It is guided by the following research question:

RQ1: What conceptual model could synthesize the existing findings concerning universities as culture change agents for sustainable development?

The synthesis takes the form of a conceptual model that presents the perceived interplay between the key variables affecting the SD in a higher education context. Miles and Huberman [41] defined a conceptual model as a visual or written product that explains either in a graphical or in a narrative form the key factors, concepts or variables that comprise it. Developing a model serves also presenting the presumed relationships that exist between the framework's elements.

In order to develop the conceptual model, a multi-step research procedure was performed. After defining the theoretical basis for the study, the analysis of SD and the role of universities in this context was prepared. It was focused on compiling a list of key variables from the higher education context that impact sustainable development.

As the next step, the CIPO model was studied [42], as it is widely applied in education to depict the change and its constituents [43,44]. It classifies the variables affecting a given phenomenon into context (C), input (I), process (P), and output (O) categories. The Scheerens' framework promotes the effectiveness approach which is focused on the instrumental value of input and process indicators to maximize output. It appreciates the agency of stakeholders and arranges the elements into the cause–result continuum.

In the following stage of the study, the variables identified during the analysis were categorized according to the context, input, process, and output (CIPO) model so that they present the perceived interplay between the actions and impacts of the university and the sustainable development. Thus, as a result of applying the research procedure and inductive reasoning a conceptual model was constructed: universities as culture change agents for sustainable development. It brings together the various identified categories specific to higher education context that contribute to SD and showcases the university as a cultural change agent. It maps out the various concepts such as university's quality culture, sustainable development, functions of a university, stakeholders and forms a roadmap for universities how to become culture change agents for SD. The model builds upon the findings from various fields of studies and forms a construct that requires further verification through follow-up investigations that will test the framework.

4. Universities as Culture Change Agents for Sustainable Development

Universities are considered one of the pillars of change that drive society [45–49]. Although the core of university operations has remained the same for centuries the universities continue to evolve. Their roles, priorities, modes of operations and functions have changed over time. The history shows their shift from the elite universities to contemporary mass academic institutions [50], from "ivory towers" to "partners" embedded in the economic, social and political context of modern societies, from humanistic to neoliberal institutions [51] and from "Humboldtian" to more market-oriented modes of operations [52–54]. Nowadays, universities are regarded as significant drivers of a knowledge-based economy [55] and increasingly, they play a more active and interventionist role, related to innovation and the economy, the delivery of wider social goals and the transformation of society [56]. They play a part in fostering wider economic growth by preparing highly skilled labor. They take either a responsive role which focuses more on responding to changes and demands or an autonomous stand that is characterized by creating change and new opportunities at the university and beyond the place of its physical location. Some higher education institutions (HEIs) choose to become agents of change and transformation for both students and the social context in which they operate, some remain the agents of reproduction and legitimation, or play both roles at the same time [56].

The worldwide discussion continues what role higher education institutions should play in society nowadays and what future might require from them. Literature highlights especially the regional role of universities. In the context of new pressures on higher education to embed itself in the local economy, culture, and the system of politics [57] universities increasingly become development engines for the regions and mobilize their change. They might contribute in several dimensions, for example,

they support economic advancement, change the image of a region, inspire cultural change, promote aspiration raising, provide opportunities, tackle inequalities and relative disadvantage, promote active citizenship, offer leadership and coordination, etc. [56]. It is also clear that universities may play an important role in promoting the principles of SD within their institutions and in society [58,59].

The major universities functions have evolved to meet the expectations from HEIs to become stronger regional and national players. In their research capacity, HEIs gradually moved from the ethos of science to industrial science and in the teaching function from educating an intellectual to shaping a specialist [51]. Universities contribute also more than any other social institution to the development of civil society. Their involvement with society can be operationalized through the HEI's openness to the wider community to engage with and respond to local interests and needs. These may not be directly connected with the main areas of research and teaching offered by the university, but rather linked at the level of interests and aspirations. The provision of public lectures, cultural events, museums, and engagement with local media are all ways in which universities can be open to the wider population. Even access to university facilities can positively affect the short- and the long-term relationships with the community [56].

Due to the high importance of universities for humanity and civilization, many scholars see the impact of universities on SD as vastly greater than any other single sector of society [7–9]. Universities constitute a vehicle to explore, test, develop, and communicate the essential conditions for sustainable development [60–62], because they play a crucial role in the development of economic systems through disseminating knowledge, creating innovation, promoting sustainable development, environmental friendliness, and fostering cultural growth [62]. Stephens et al. [63] highlight that universities should be able to "catalyze and/or accelerate a societal transition toward sustainability". Changing peoples' value-system demands a new paradigm of thinking driven by transformative ways of knowing, thinking and learning [64]. Therefore, the goal of universities for sustainable development is to enable the university stakeholders to reflect, through multicultural, global and future-oriented perspectives, on their responsibility for the complex effects of their decision-making and behavior [65].

Complex operating environments and a variety of sustainability issues require higher education institutions to consider the relationship with their stakeholders as strategic [66] since they can influence the success or failure of the university operations as the culture change agents for SD. Identifying and categorizing university stakeholders is a complex task [20]. University stakeholders are perceived to be numerous and varied in type depending on the respective mission the university seeks to fulfil. Many studies are defining and classifying universities' stakeholders [20,67–71]. In our study, we adopt the list of university stakeholders by Marshall [72] that embraces students; alumni; donors; parents; other institutions or providers; accrediting agencies; vendors and suppliers; employers; taxpayers; non-government organizations; government; and academic faculty, both individually and collectively in disciplinary groups and as members of other organizations such as unions and advocacy bodies. The list of stakeholders shows how extensive the outreach of university is and on how many institutions and individuals the university can have an impact on directly and indirectly. However, despite many initiatives, formal declaration, programs, conferences, and lively debates that concern universities' potential to create SD as well as an increasing number of universities engaging with SD, research confirms that universities have remained quite traditional, relying on Newtonian and Cartesian mental models. They tend to rely upon reductionist and mechanistic paradigms and, therefore, they generally still lag behind corporations and governments in regards to contributing to making societies more sustainable [73] despite the potential that they have as culture change agents. There are many barriers to the diffusion of SD in universities, just to mention the existing mental models, coupled with resistance to change, and in some cases the self-replicating system of universities, lack of funds, lack of awareness of the SD or the motivation [74–80]. However, what is usually ignored while analyzing the barriers of SD is the factors of culture and quality. Sustainability to be promoted, it needs to be rooted in social culture and university awareness [81].

5. University Quality Culture for Sustainable Development

In order to model sustainable practices for society, HEIs should start with themselves. They need to promote the sustainable practices in their environment first before they reliably advocate and promote the cultural change to the society [63]. Therefore, HEI's internal culture and quality of university operations need to be the areas of focused attention and efforts. Both of these aspects can be found in the concept of university's quality culture which is defined as an organizational culture whose main aim is to constantly improve the quality of an academic institution [82]. It consists of two key components: the first one comprises cultural and psychological elements such as common values, beliefs, convictions, history and academic traditions, expectations and commitment to quality improvement, while the second denotes structural and managerial aspects such as external and internal legal acts or regulations, defined processes helping to coordinate the quality improvement efforts [82]. Both components: structural and managerial elements (referring to the institution and implemented through a top-down approach), as well as cultural and psychological elements (referring to the role of individuals and coming through the bottom-up mode of operations), need to support and complement each other to bring the best quality enhancement effects in a university [82–85]. Building a strong and sustainable quality culture is based on mutual trust between all parties of the educational process [86]. It is not enforced, but rather built step by step, action by action, until it becomes a reality [87].

Hildesheim and Sonntag built upon the work of the European University Association and developed a model of quality culture that considers both structural-formal and organizational-psychological aspects [88]. The authors of this study think that Hildesheim and Sonntag's model of quality culture can be used as a systematic approach to implementing a transformative strategy that aims at building such a quality culture at a university that is supportive of sustainable development. Following the model's logic, for a university to become SD-oriented, first of all, the structural-formal elements of normative, strategic and operative kind would need to be prepared to legitimize the framework for a transition. SD should be then clearly defined as a goal (normative level), responsibilities should be assigned to various stakeholders (strategic level) and specific tools and implementation measures would need to be planned (operative level). Secondly, the organizational-psychological elements should be taken into account at the collective and individual levels. The communication of a goal of actively promoting sustainable development would be required from the university leadership. The communication strategy should focus on presenting the benefits of SD for the stakeholders and beyond and encourage their active involvement. The messages would need to be followed-up on through a participative endeavors exemplifying the commitment of the leadership to implement changes that would fulfil the goal of becoming a more sustainable university. Following up with actions validating the declarations always helps to build trust between the stakeholders and contributes to the formation of shared values. Additionally, a system of supports needs to be in place to promote the new transition strategy and various bottom-up initiatives. All concerns, doubts and misconceptions should be professionally addressed. If such a transition strategy is properly implemented with attention to quality, transparency and details, then the actions denoting commitment, responsibility and engagement in promoting the SD principles at the individual level should start popping up and gradually the quality culture for SD should start building up. What remains a challenge is to make sure that the SD goals do not conflict with other goals and constraints that HEIs and their staff operate under. Moreover, the organizational change must be adequate for the capacity and resources of the institution.

The implementation of a quality culture that favors sustainable development is not an easy task. Ramos et al. [89] underline that "across the world, but particularly in Europe, some universities have become leaders in the field with very good practices. But unfortunately, many of those efforts address only one or two of the sustainability domains at HEIs, which continue to foster compartmentalization, instead of a holistic approach (e.g., an approach which is inclusive and takes into account inputs and knowledge from different subjects) and a systems thinking approach". For a holistic change to occur universities need to lead with quality improvement mindset visible in every aspect of operations: education, research or engagement with society. The attention to the quality of SD-oriented activities

will support the process of becoming a role model and thus an agent of change. The quality culture favoring SD is visible through several artefacts and activities on campus. For example, many programs allow campus community members to become socially engaged with others in environmental learning and action, and these programs may support the development of social norms for environmentally sustainable behaviors [90]. Academic institutions have numerous volunteer organizations where students can engage in various environmentally-friendly actions. HEIs initiate programs that organize students and employees to positively influence their peers as sustainability ambassadors, conservation advocates or eco-reps. Examples of means of raising sustainability awareness include supporting student and staff's understanding of major environmental issues and how to address them, introducing campus recycling programs providing guidelines on greening one's workplace promoting programs for purchasing green cleaning supplies. Some HEIs indirectly teach their campus community members about environmentally sustainable practices by displaying their solar panels. Other ideas for promoting SD and becoming a role model for that include material incentives e.g., free bus ridership or free bike rentals. Competitions promoting energy reductions in dormitories, light bulb exchanges for more energy-efficient bulbs and small or local environmental projects support the awareness-raising process on campuses and thus add to the spread of SD concept across the university and beyond. SD initiatives incorporated into campus operations include also energy use and energy efficiency, waste and water management, food purchasing, transport, but also improving accessibility to "green" solutions for people with special needs [91].

Summing up, the findings of the European Universities Association's work [82] pointed out that a mature quality culture was developing well in such organizational structures where institutional responsibility was emphasized, with very mindful and reflexive implementation of transformative projects. It is in the quality of decisions and everyday actions that the principles of SD become visible. Therefore, as EUA pointed out, the development of quality culture should be regularly monitored and evaluated for meeting its purpose. Universities need to create a culture for SD by setting themselves as "inspiring examples". Getting involved in the sustainable practices within their campuses, incorporating SD into the day-to-day activities in the university experiences and encouraging campus sustainability life experiences can build their position as role models and thus culture change agents for sustainable development.

6. Implementation of Universities' Main Functions for Sustainable Development

The University's approach to sustainability should evolve to incorporate sustainability goals in teaching, research, and community engagement, as well as campus operations [92]. Sustainable development requires a change in people's core assumptions, values, artefacts and resulting actions. A holistic and multilevel perspective on the culture created by the university that could lead to SD is necessary in all the dimensions of universities' operations. Universities might create a culture for SD through:

- teaching that addresses sustainability challenges;
- use-inspired, real-world problems-based research;
- engagement with individuals and institutions.

Sustainability challenges currently faced by universities are complex and multifaceted and, therefore, require that fulfilling the three main university missions: education, research and engaging with the society need to be correlated to contribute substantially to developing culture and agency for sustainable development [9].

6.1. First Mission: Teaching for Sustainable Development

Graduates of universities will be the future decision-makers addressing sustainability challenges, therefore it is crucially important how the university will impact the students' competencies, values, attitudes, as well as their future actions towards SD. The unique role of universities for SD has been

described as creating deliberative space and learning opportunities for students to develop skills, values and action competence—allowing individuals and groups to move towards SD through "a new way of being and seeing" [93]. There is a consensus among researchers that universities play an important role in meeting the challenges of SD through education [63,94–100]. Teaching and learning are the main levers through which universities can implement the principles of sustainable development [58]. Geitz and de Geus [101] underline that an important goal of universities is "to support students to gain control over their learning, help them develop skills and apply strategies to take the lead, and educate students in such a way that they become self-regulative learners, resulting in a lifelong, sustainable impact on their personal and professional development". Universities' role is to transform today's students into tomorrow's leaders for future market realities by equipping them with sustainability perspectives required for socially responsible business [65]. Focusing particularly on the role of education, Blewitt [102] emphasizes the need for more explicit attention on changing students' attitudes toward sustainability and on enabling them to recognize sustainable opportunities through teaching. Irina Bokova, Director-General of UNESCO indicates: "A fundamental change is needed in the way we think about education's role in global development, because it has a catalytic impact on the well-being of individuals and the future of our planet (. . .) Now, more than ever, education has a responsibility to be in gear with 21st-century challenges and aspirations, and foster the right types of values and skills that will lead to sustainable and inclusive growth, and peaceful living together" [103]. Sustainability-competent graduates should be able to cross boundaries between bodies of disciplinary knowledge, between cultures, and between theory and practice [104]. Sustainable development principles might be integrated as theoretical content in curricula or provided through practical student projects. Radinger-Peer and Pflitsch [105] underline that "while a theoretical consideration of sustainability issues helps to raise awareness, practical student projects in collaboration with regional stakeholders can have a direct impact on the regional transition path" towards SD. Courses and programs on SD help to create the knowledge and awareness necessary to drive changes towards a sustainable future ([106]. Universities need to create study programs and organize extracurricular activities to prepare future generations of professionals as well as political and social leaders for responsible actions toward sustainable development [107]. In the teaching process it is not only important what students need to learn but also how they should learn. The latest literature on higher education for sustainable development emphasizes the need to cultivate contemplation and creativity, explore the opportunities associated with divergent thinking, promote transdisciplinary inquiry and empower students to think and act differently than required within conventional educational approaches [108]. Teaching for SD should be based on the interactions between teacher–students and dialogical process; learning and teaching means communicating and jointly giving meaning to elements in our environment [109]. These interactions are the sources of knowledge creation. Moreover, knowledge should be developed in new and authentic situations related to the real-world problems.

All professions have a role to play in transforming societies towards sustainability. For instance, in the area of business education, the Principles for Responsible Management Education (PRME) were established by the UN in 2007. They aimed to promote sustainable development ideas at universities around the world by providing business school students with the ability to make social and environmental changes. According to the principles, it is necessary to introduce "a process of continuous improvement among institutions of management education to develop a new generation of business leaders capable of managing the complex challenges faced by business and society in the 21st century" [110]. Therefore, "competent engagement" [111] in the field of sustainable development requires students to have particular attitudes and skills [112–114].

Based on the literature review [103,110,115–119] some skills are recognized as the most important for sustainable development:

1. **Social skills**: Team building and teamwork, communication skills, interpersonal relationships and collaboration, communication and use of the media, ability to motivate others, problem-solving ability to cooperate, participatory skills;

2. **Personal skills**: Critical thinking, analytical work, computational thinking, systemic thinking, anticipatory thinking, self-awareness, decision making, leadership, creativity, problem-solving, empathy and change of perspectives ability, strategic thinking, personal engagement (self-motivation, learning), the ability of assessment and evaluation, tolerance for ambiguity and uncertainty, emotional intelligence (transcultural understanding, empathy, solidarity, compassion), creativity, self-regulation, critical consciousness;
3. **Intercultural skills**: Tolerance, empathy, understanding for otherness, openness, cross/inter-cultural competence, competency in cosmopolitan perception, transcultural understanding and co-operation;
4. **Service skills**: Volunteering, empathy, social responsibility, global mindset, ethical awareness, empathy, sense of justice, capacity for compassion and solidarity;
5. **Business in the real world skills**: Stakeholder management, engagement of community needs through business, marketing, sustainability enhancement, entrepreneurship, project management, planning and coordination of interdisciplinary work, the ability to take action (participatory skills), future orientation, strategic competency, integrated problem-solving competency, competency in planning and implementation.

The above-listed skills are vitally important to support problem-solving and decision-making supporting SD. The role of the universities as culture change agents for future SD is to develop these skills in their graduates. As it is underlined by Hensley [108], teaching for SD should help students reconceive the role of humans on the planet and cultivate reflection, innovation, and integration to tackle the grand challenges associated with sustainable development.

6.2. Second Mission: Scientific Research for Sustainable Development

Acknowledging the urgent need for sustainable development and the importance of research in this process, universities and their researchers bear the moral responsibility to contribute with their work to sustainable development [120]. Research is one of the pillars of universities, seeking to create the multidisciplinary, interdisciplinary and transdisciplinary knowledge required to promote societal changes [121]. Universities, through their multi-sector research capabilities, have an important role in providing the appropriate knowledge, evidence, solutions and innovations to support the SD agenda [58]. "Research for sustainable development" can be understand as research that is directed at supporting sustainable development by providing knowledge about whether change is needed, and if so, how it can be brought about [122].

The university research is pivotal for SD, but to succeed, new ways of conducting research are needed [120]. In the Declaration on Science and the Use of Scientific Knowledge of UNESCO it is underlined that "The sciences should be at the service of humanity as a whole, and should contribute to providing everyone with a deeper understanding of nature and society, a better quality of life and a sustainable and healthy environment for present and future generations" [123]. Given the pressing need for sustainability, universities should consider research for sustainable development not merely as an "academic exercise", but as a "vital response" to a rapidly evolving sustainability crisis which should be at the top of its research agendas [124].

Wuelser et al. [122] underlines that sustainable development as a strategic issue is about moral choices and the shaping of the required change by policy processes in the broadest sense. Research that is committed to support sustainable development can thus basically contribute to (1) understanding an unsustainable situation, including its genesis and possible future trends; (2) clarifying specific goals or directions of change in accordance with the sustainability core objectives; or (3) designing pathways to bring about the respective changes. In order to become a culture change agent for SD, the new ways of research practicing are needed. The table below presents the characteristics of university research that supports SD (Table 1).

Table 1. Characteristic features of the university research approaches that support SD.

Collaboration
1. Openness
2. Networking
3. Internationalization
4. Proactive attitude
5. Participation and engagement
6. Societal peer review
Independence
7. The freedom of choice
8. Transparency
Bridging between theory and practice
9. Commitment to knowledge generation, knowledge transfer and capacity-building for sustainability
10. Interaction between science and practice (transdisciplinarity) through active participation of stakeholders
11. Combination of academic solutions with practical skills
12. Use-inspired, real-world, problem-oriented focus
13. Applicability
14. Knowledge transfer
15. Public interest
16. Environmental, safety and security management
Innovativeness
17. Open-mindedness
18. Multi- and interdisciplinary approaches
19. Multidimensionality
20. Readiness for dealing with uncertainties
21. Creativity
22. Systemic perspective
Results-oriented
23. Impact monitoring
24. Relevance check
25. Free access to the results of research
26. Holistic solutions
27. Sustainability relevance
28. Sustainability impact
Time and scale
29. Different time perspectives (short, medium and long term)
30. Different levels of scale (local-global)
31. Forward-oriented undertakings
32. Intergenerational approach
33. Continuity of initiatives and actions

Source: own work based on Waas [120], Hansen and Lehmann, [125], Casarejos et al. [126], Sedlacek [127], Beringer and Adomßent [128], Soini et al. [129], Filho (Ed.) [130].

Among all the characteristics mentioned above, it is worth underling the importance of collaboration for the success of academic performance in the field of research. As Adieri et al. [131] notice "the scientific openness degree of universities towards other academic institutions is becoming more important in the analysis of knowledge flows between researchers. This topic is central to the accumulation of human capital and talents' allocation for countries' economic growth". When doing research, staff are engaged with the national and international aspects of the change processes [105] that may lead to SD. Sharing the results of scientific research, e.g., via academics' participation in international conferences are opportunities for knowledge exchange that help to influence organizational change in higher education institutions regarding sustainable development [132].

Research that is committed to supporting sustainable development has to be concerned with understanding current and exploring alternative sorts, contents and aims of policies and policy processes as well as their implications on humans and nature [122]. It is also important to underline

that the universities should apply the bottom-up and demand-driven process of selecting the research options. For this reason, universities need to have well-developed contacts to business and other groups in society to be able to identify the areas of research that are in need [125]. Addressing this requirement is closely related to fulfilling the university's third mission: engagement with the wider community.

6.3. Third Mission: Engagement for Sustainable Development

Universities are important culture change agents fostering SD that can be exemplified through the relationship between the business and the society. This engagement is frequently called "third mission of the university" and consists of working towards the improvement of people's lives and solving global problems [133,134]. The development of universities' third mission (i.e., regional development and social engagement) requires stakeholder participation, which is crucial for organizational change towards SD [135]. Universities, while executing their third mission try to interact with public and private sector partners and communities to contribute and to make an impact in domains referring to SD; they make efforts to combine socio-economic concerns with issues regarding a healthy future for society, increasing environmental concerns, combating poverty and inequality [136,137]. Universities, in joint action with business and society at large, are necessary prerequisites for constructing and maintaining SD [66]. Universities can help facilitate change toward a more equitable society and a better world by adopting the goals of SD at a strategic level in pursuit of sustainability and as a means of connecting higher education with business, industry, healthcare, community partners and entrepreneurs [11,63].

Universities that more closely interact with the society, do not only have the opportunity to make changes, but they also have the moral responsibility to develop and disseminate necessary knowledge, values, skills, and awareness to create a sustainable and fair future [1,138]. Universities have been recognized to play a key role (a catalyst) in sustainable development by supplying the regional entrepreneurial ecosystem with a skilled labor force, by developing new knowledge and technology, by making these resources available to local organizations and by spinning off (new) companies [139–142] in an increasingly complex environment of stakeholders and shareholders [143]. The opening of new universities and research institutes has been shown to boost a region's economy in numerous places around the world [144]. The commercialization of knowledge created by universities or the creation of (high tech) spin-offs are often linked to the sustainable development of the regions where the university has its impact [145–149]. Universities have a specially important impact on the surrounding region where they are located. At the regional level, universities are important actors for local development as they have the potential to provide their expertise and specific know-how through their close connections with civil society actors. They are agents of academic knowledge transfer to the region [127,150]. Moreover, universities can serve as facilitators between societal and other institutional actors in the region towards fostering sustainable development [127]. Knowledge sourced from collaboration with business and society affects the sustainable innovation orientation that may contribute to sustainable development [151,152].

According to UNESCO [153], the creation of the SD by universities can be achieved by bridging the gap between knowledge generation and the transfer of this knowledge to society via service and outreach and by implementing sustainable practices internally through financial management, alternative transport, innovative teaching practices and curricula, building maintenance, research, consultancy, and natural resource reduction—in other words, by being entrepreneurial, acting with and for society and seizing opportunities.

7. Model Proposal

A Conceptual Model of Universities as Culture Change Agents for Sustainable Development

The model presented in the Figure 1 assumes that a university, through its operations in the areas of teaching, research, serving the society and by setting an example, is in a unique position to exert influence

on culture and agency of its stakeholders to take an active stand towards sustainable development. There are, however, major conditions for this logical framework to be valid. HEI's representatives must realize the urgency of humankind to follow the sustainable development path and the actions taken must be of appropriate quality, ideally, implemented with an internalized quality culture approach. The role of university staff is key due to their socially-responsible role of knowledge production, reproduction and dissemination. The means that they have within their locus of control such as teaching, carrying out research projects, communicating with the wider community or becoming the role models are so powerful that they can have a real impact on the other stakeholders' culture and their agency, both needed to have a lasting effect on economic, social and environmental aspects of sustainable development. It is the assumption that the authors of this model make that if an institution is penetrated with the widespread quality culture approach where the mission advocates sustainability then by using its main modes of operations (educating, researching and serving the society while being the role model themselves) it can effectively play the role of a culture change agent for sustainable development.

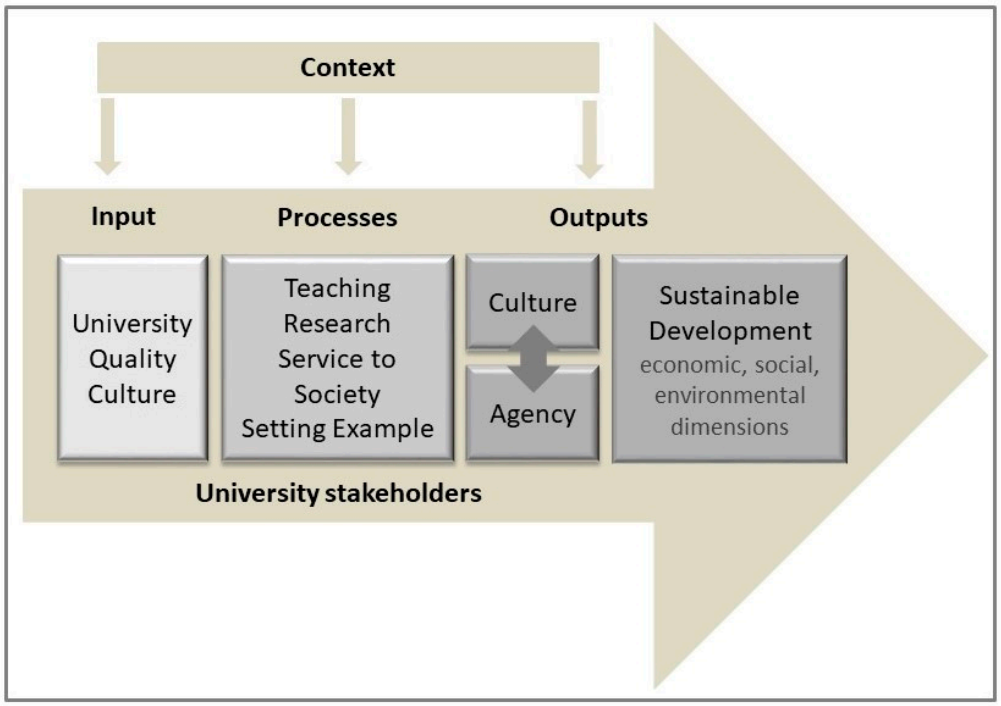

Figure 1. Universities as culture change agents for sustainable development. Source: own work.

The elements of the model play interrelated roles in the creation of sustainable development. The context for the implementation of the SD-oriented changes involves an abundance of challenges facing universities nowadays. They include the emergence of new problems that question existing solutions when dealing with issues such as climate change, biological intervention technologies, transnational law and justice, global poverty, housing diversities, energy crisis [79]. At the same time, it is widely recognized that universities play a crucial role in the development of economic systems based on disseminating knowledge and innovation, promoting a more resource-efficient economy, greater environmental friendliness and competitiveness to foster cultural growth and social and territorial cohesion [62]. The context in which universities operate on one hand offers an increasing number of challenges to address, but on the other creates opportunities to make a lasting impact. With all the outreach possibilities the universities are uniquely positioned to listen to the SD challenges and spearhead solutions to be tested and replicated.

According to the proposed model, the major input for the SD-oriented change that a university can offer is its quality culture advocating sustainability. Its development should be supported

by both the structural-formal and organizational-psychological elements [88]. Establishing SD as the strategic goal supported by the quality measures is a condition for an effective change to take place. Communication, cultural attitudes and SD-oriented initiatives can positively affect campus sustainability. Without building shared conceptualizations of the SD, there may be communication failures.

While some teaching and research environments have sustainability as a core objective for their work, in most departments sustainability has not been a central concern. Also, scientific and political conceptualizations are very diverse, and issues can be approached from many perspectives. Consequently, there is plenty of room for misunderstanding. Therefore, universities need to realize that the way they build their quality culture adhering to SD and operate on an everyday basis is very powerful for modelling the behaviors and actions of others. They set examples to follow and what dominates in their university quality culture can easily get transmitted to the culture of society. Thus, it is universities' key role to assure that their quality culture advocating SD is built responsibly, diligently, continuously and with attention to the details that matter.

The process of culture change for sustainable development is modelled by the three key functions of a university: education, research and engagement with the community. Teaching should involve joint learning and account for a shift from the "succession of knowledge" to the "co-creation of knowledge" in knowledge-sharing efforts [154]. It should offer inspiration and mentorship to the students which to a large extent should determine the quality of their contributions upon graduation [155]. Education has been prioritized as an important strategy that has a major role in bringing about sustainable development through the impact it exerts on the stakeholders [156]. Teaching for sustainable development should aim to make the students aware and ready for the major real-world problems they will face during their lifetime. Research in universities aiming to become culture change agents should be holistic, dynamic and focused on the real-world problems. The scientific efforts need to be multi-dimensional and concentrate on linkages between the biological, chemical, economic, geological, physical, political and social systems, and to search for dynamic and cross-systemic explanations [120]. Several conditions must occur to let the universities conduct a research that will lead to future SD:

- A system of education already at the level of primary and secondary education must be maintained and tuned accordingly to the scope of future SD [125].
- Universities must have well-developed contacts to business and other groups in society to be able to identify needs for research [125].
- It is necessary to introduce the concept of "open science" and open access to knowledge that would facilitate independent replication of scientific research results, which would enhance the generalization of results, increase the possibility for exchange of useful ideas, products and technologies, and help avoid duplication of results [157,158].
- Universities must be independent in terms of defining areas of research that they consider important for the sake of seeking new knowledge and understanding [125].

Strategies and drivers for sustainability in HEIs implicate also the local, regional and global engagement of HEIs in meeting the SD goals by promoting local and regional intervention, internationalization and networking (international cooperation, students mobility and knowledge exchange), and acting always with high societal relevance and sustainability purposes [74]. The whole process of change requires the engagement of stakeholders in the universities' activities [159] and the engagement process may be understood as exchanging information, listening to and learning from each other [160]. Successful and effective stakeholder engagement also requires openness, dialogue, resources, integration and collaboration, leadership commitment, understanding of needs, systemic thinking, capability to deal with environment and market volatility and ambiguity [152]. Stakeholder engagement can be seen also as a social learning process, where diverse stakeholders share a common forum, learn about each other's values, reflect upon their values and create a shared vision and objectives [161], which forms a basis for stakeholders' agency.

The outputs that result from the described context, inputs and the processes involve the package of culture for SD intertwined with an increased agency of stakeholders and sustainable development operationalized through its economic, social and environmental dimensions. Culture is at the root of human decisions and actions, and an overarching concern (even a new paradigm) in sustainable development thinking. It is seen as a key factor, a condition or a means for achieving sustainable development [40]. Therefore, the culture for SD is the expected output of the change that needs to be made explicit, discussed and argued within the sustainability debates and translated to the decision making [2] and actions to promote and enact sustainable development into everyday behavior of society members.

The presented model offers a novel synthesis of key concepts that play a role in the development of culture for sustainable development with universities as culture change agents due to their outreach possibilities and the impact they exert through their leadership, the fulfilment of the three missions and promoted modes of behaviors and actions. The CIPO framework offered a systematic approach to logical presentation of implied relationships. The assumptions underlying the model were grounded in theoretical and empirical findings. As a result, a new roadmap for policymakers or universities that want to develop themselves as the culture change agents for SD was created that can serve as a signpost or an evaluation framework promoting a structured reflection process for universities' leadership.

8. Conclusions

For centuries, the universities have been at the forefront in creating and breaking paradigms and educating the future decision-makers, entrepreneurs, and leaders [1,80,162]. They also play an important role in the creation of the society culture: peoples' core assumptions, values, beliefs and artefacts that translate into agency. As sustainability is an ethical, value-laden and moral goal, the way it is defined, interpreted and understood will be eventually driven by people's personal experiences and worldviews [118]. Therefore, universities are uniquely positioned to play the role of change agents that shall take the responsibility of promoting and implementing the culture for sustainable development. That is why they are expected to help humanity create culture and agency that would allow to meet the world's current demands without compromising the needs of future generations. Universities play a vital role in the creation of SD through the fulfilment of their three missions: teaching, research and interactions with business and society, of which especially the third one is often underestimated [127]. Universities are also looked up to as examples to follow, therefore, their internal quality culture focused on SD is vital for modelling the behaviors of stakeholders. Thus, universities have been charged with key roles in promoting and implementing sustainable development as well as ensuring that the needs of present and future generations are better understood and addressed [163,164].

The implementation of the three missions and setting universities as examples lead to the change of culture expressed through the beliefs, artefacts, and attitudes of their stakeholders. This also evokes modification to the agency of the stakeholders, particularly today's students that soon as graduates: Managers, leaders, politicians will shape our future. It is important to highlight that having a standalone SD-oriented program without a holistic support framework within the institution challenges the adoption of sustainability as an individual pursuit. Instead, incorporating SD within the operational structure of an instruction establishes a cultural value [17] that should form the goal to be internalized in the university quality culture.

The paper contributes to the body of knowledge by formulating the conceptual model of universities as culture change agents for SD that offers a novel synthesis of findings in the area of SD and the role of universities in this field. It displays the key elements such as university's quality culture, missions of university, sustainable development and stakeholders within the framework of Context–Input–Process–Output thus forming a guideline for HEIs on how to address the transition into an SD-focused university in a systemic way. The model links various fields of studies: education, management, sociology.

The proposal of a conceptual model presented in this paper may have relevant implications for university leaders. It is of high importance that they develop a deeper understanding of the role the universities can play in contributing to the creation of sustainable development through their impact on stakeholders. Taking into account the systematized paths of impacting the stakeholders and becoming the culture change agents for SD offers a significant input for (re)considering their institutions' mission and strategic goals as well as everyday actions. The presented considerations hopefully contribute also to raising the awareness of the fact that quality matters in every aspect of university operations. Quality constitutes a determining factor for the success in the SD creation. Therefore, the model can be useful for university governors when considering how to take greater care of policy decisions concerning quality at universities and how to build a quality culture that advocates sustainability. It is worth noting in this process that the desired behaviors of the university members should be incentivized rather than mandated by bureaucracy or regulations.

The presented model may have also relevant implications for policymakers. Universities have a responsibility to promote a systemic approach to the multiple societal challenges, but they cannot do so if they act in isolation and without appropriate support. Being conscious of the impact mechanisms that the universities have on the development of sustainability may direct the attention of the governments, funders, and others that understand and share the SD idea to support universities in their efforts focused on SD. Therefore, it is important to increase the awareness of the role of universities for SD and encourage policymakers to take appropriate steps to support and help universities play this important role in society.

The limitations of the study result from the methodological constraints of the applied procedure. The inductive reasoning to develop the model which leads to a grounded theory does not allow for generalizations, but it forms a construct that requires further verification through follow-up studies that will test the model, the strength of the implied relationships and effectiveness of the paths to SD depicted in the model. Sustainable development has to be understood as a process of change. The theoretical framework presented in the form of the conceptual model of university as a culture change agent for SD should be considered as a launching pad for its practical application, future development and empirical testing. These areas offer the future directions for the studies on universities as culture change agents for sustainable development.

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