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Editorial

Including Sustainable Development Goals (SDGs) Transversally in Education

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Since mid-last century, the international scientific community has been developing a concept that each day presents more and more varied ramifications: sustainability. At the beginning, this term was used almost exclusively in the environmental field and directly implied factors such as pollution and deforestation or phenomena such as acid rain; for some time now, sustainability has been successively and inexorably permeating almost all dimensions of human activity [1]. We no longer only speak of environmental sustainability, and the label reaches cultural, economic, and social domains or even the artistic domain. The sustainable is that which remains timely, because it is a practice in harmony with the present but, above all, with commitment to the future. This commitment could well be understood as the key to the success of anthropic activities. It is not possible to speak of sustainable natural-resource utilization if resources are exhausted in this generation and if the waste produces pollutants and poisons the environment. It is not possible to speak of sustainable practices if these, whatever they may be, annul or eliminate the traditions and customs of a nation's cultural heritage. In short, it is not possible to speak of sustainable methods of doing anything (education, consumption, economy, or culture) if the richness and diversity of the present moment is not guaranteed and preserved for future generations.

In this sense, it is very interesting to observe how the concern for policies to improve people's living conditions has included the concept of sustainability and has expanded the frontiers of this idea. Particularly striking is the drift in the global plans of international institutions such as the United Nations [2] or the World Bank [3]. The former case is particularly significant.

While we can go back to the mid-twentieth century to witness the founding of the United Nations (UN) Development Programme, the successive plans implemented by the UN focused on the ever greater dimensions of human development. Thus, at the dawn of the new century, the Millennium Summit set out goals that would supposedly lead to more just and equitable human developments. The Millennium Development Goals (MDGs) were formulated, which set eight human development goals to be achieved 15 years later [4].

Following the relative success of the MDGs [5,6], the UN reformulated their proposal with what we know today as the Sustainable Development Goals (SDGs) [2]. The differences between the two plans are striking, but perhaps the most significant is the incorporation of the concept of sustainability from a global perspective. If MDGs considered the low human development index as a problem or circumstance for which its root, reason, and main implications were found in the economic South, SDGs broaden this view and understand that development and underdevelopment are complementary dimensions and that a holistic and global approach is necessary to provide an effective response and ensure justice, freedom, and wealth for humanity. Sustainability is key, in this paradigm,

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to advances in human development that reach all people; moreover, all countries must be involved in this task. It must bring together the agreement of different actors: civil society, companies, administrations, etc. [6–8].

This transfer from the vision of MDGs to the perspective of SDGs also coincided with guidelines set by anti-globalisation movements (later called alter-globalisation movements), which focused on global transformation from the local level. As another method of understanding sustainability, the currents of action and thought not conforming to the master lines of capitalism understood that change for the better and the development of the world's peoples necessarily involved local action. This was another revision towards sustainability, tuning the changes on a large scale from what was happening at the small, close, and proximate level.

Perhaps the great revolution of the SDGs was precisely this: the systematisation of the concept of sustainability from the near to the far and from the immediate to the international stage. SDGs have given nature to sustainability as a key to successful human development. Understanding that this sustainability transcends the environmental, influences the political, and affects the social, and SDGs are basic to understanding that the changes sought in a world with multiple needs (from climate to the economic, if they are different things) are rooted and necessarily connected to making human development, in all its dimensions, sustainable.

Parallel to the transformation of the concept of development, there has been an evolution in the understanding of education for sustainable development [9,10]. A consensus exists regarding education's importance for achieving SDGs [5,7,8,11], and for this reason, there has been a proliferation of studies that address this issue in the scientific literature [11–13].

In education, that which is not in any specific place, but which cannot fail to be in all places, is the transversal [14]. Transversal competencies are those that should be promoted from all educational dimensions and, therefore, do not belong exclusively to any of them [15,16]. Following this reasoning, it was evident that, if sustainability had to reach education, it would do so hand-in-hand with the transversal. It is not possible to think of teaching sustainability if it is not transversal, developing educational competences set out in different studies in a multimodal manner. Hence, there is a need for academic work to evaluate how, when, how much, and with what success the SDG's socio-cultural paradigm could be introduced from current educational scenarios. We have sought to answer this question, at least partially, with this issue published jointly in the journals *Sustainability* and *Education Sciences*.

A total of 10 contributions have been published (Appendix A), with 7 in the Special Issue of the journal *Sustainability* (Table A1) and 3 in the journal *Education Sciences* (Table A2).

The Special Issue of *Sustainability* has seven articles.

In the first, Martínez-Borreguero et al. studied environmental and emotional awareness and self-perceived effectiveness in a group of 160 students training to become primary and secondary school teachers at a Spanish university. In the study, the authors found a positive attitude of the students towards integrating sustainable development in their jobs. However, the authors detected that there is room for improvement in the materialisation of these desires to build a more sustainable world by implementing more sustainable actions and behaviours (Table A1, contribution 1).

In the second contribution, González-Domínguez et al. analysed a project-based learning experience in the context of the circular economy. The initiative was carried out in a transversal manner in several university subjects during a period of five academic quarters. In the paper, the initiative is both described and analysed using a 30-item survey. The students stated that they were unaware of the concept of circular economy before carrying out the initiative and indicated the usefulness of the development of this type of work in their training as product designers (Table A1, contribution 2).

Castilla Polo et al. studied the importance of social responsibility training in the university context. They carried out a pre–post study with accounting students after two activities in the field of social responsibility education. The study showed that the

activities had a considerable impact on the students and that they were more aware of the cost–benefit impact of the decision to engage in socially responsible activities (Table A1, contribution 3).

Marcos-Merino et al. studied the environmental awareness of primary education students in a Spanish university. Their results confirm the urgency of introducing sustainability in primary education studies as it has a multiplying effect. University students are aware, and a change in the orientation of future teaching is foreseen (Table A1, contribution 4).

Niens et al. analysed training and orientation of primary school teachers in Madagascar in the field of education for sustainable development. The article aims to establish a baseline in the areas of health and land use by investigating whether differences exist based on the school's location (urban or rural), whether they are public or private, and gender differences (Table A1, contribution 5).

Marujo and Casais studied the promotion of happiness and its relation to the Sustainable Development Goals, particularly SDGs 3, 4, and 16. The authors present, as an example, work at a Portuguese institution—the UNESCO Chair on Education for Global Peace Sustainability—proposing lines of work for research and practice in the field of education (Table A1, contribution 6).

Finally, Solano-Sánchez et al. studied the perception of Elsa Polytechnic School Institute students (Dominican Republic) towards sustainability issues. Artifactual Neural Networks were used in this study by examining the relationship between the answers obtained from students and variables such as gender, age, high school grade, and the number of people in the household (Table A1, contribution 7).

The Special Issue of the journal *Education Sciences* has three papers.

In the first paper, Pasara uses a vector autoregressive model to relate governance and expenditure on tertiary education with the gross domestic product per capita in 51 sub-Saharan countries. The paper emphasises the importance of a stable framework for tertiary education to ensure its sustainability (Table A2, contribution 1).

Yuan et al. studied how knowledge about SDGs is perceived in a Chinese Senior High School. Building on a previous survey [17], the authors particularised it to the Chinese context. The authors found that the knowledge of SDGs among student subjects remains limited, which justifies the need to address this issue at all educational levels (Table A2, contribution 2).

Finally, Hernández-Ramos et al. conducted a literature review of the use of problem-based learning in secondary and undergraduate education. The authors analysed how this type of methodology can contribute to the development and knowledge of the SDGs (Table A2, contribution 3).

With this Special Issue, published in two journals, we have tried to contribute to reflections and debates in the academic environment regarding the context and tools for developing SDGs in the field of education. We continue to believe that, having reached the halfway point of the SDGs' timeframe, it is essential to focus on education as a lever for change to make our world more sustainable.

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Appendix A

Table A1. List of Contributions in the Special Issue of *Sustainability*.

No.	Contribution List
Contribution 1	Martínez-Borreguero, G.; Maestre-Jiménez, J.; Mateos-Núñez, M.; Naranjo-Correa, F. Analysis of Environmental Awareness, Emotions and Level of Self-Efficacy of Teachers in Training within the Framework of Waste for the Achievement of Sustainable Development.
Contribution 2	González-Domínguez, J.; Sánchez-Barroso, G.; Zamora-Polo, F.; García-Sanz-Calcedo, J. Application of Circular Economy Techniques for Design and Development of Products through Collaborative Project-Based Learning for Industrial Engineer Teaching.
Contribution 3	Castilla-Polo, F.; Ruiz-Rodríguez, M.; Moreno, A.; Licerán-Gutiérrez, A.; Cámara de la Fuente, M.; Chamorro Rufián, E.; Cano-Rodríguez, M. Classroom Learning and the Perception of Social Responsibility Amongst Graduate Students of Management Accounting.
Contribution 4	Marcos-Merino, J.; Corbacho-Cuello, I.; Hernández-Barco, M. Analysis of Sustainability Knowingness, Attitudes and Behavior of a Spanish Pre-Service Primary Teachers Sample.
Contribution 5	Niens, J.; Richter-Beuschel, L.; Stubbe, T.; Bögeholz, S. Procedural Knowledge of Primary School Teachers in Madagascar for Teaching and Learning towards Land-Use- and Health-Related Sustainable Development Goals.
Contribution 6	Marujo, H.; Casais, M. Educating for Public Happiness and Global Peace: Contributions from a Portuguese UNESCO Chair towards the Sustainable Development Goals.
Contribution 7	Solano-Sánchez, M.; Domínguez-Valerio, C.; Lendínez-Turón, A.; Aguilar-Rivero, M. Sustainable Economic Development Education: The Use of Artificial Neural Networks for the Profile Estimation of Students from Developing Countries.

Table A2. List of Contributions in the Special Issue of *Education Sciences*.

No.	Contribution List
Contribution 8	Pasara, M. Economic Growth, Governance and Educational Sustainability: A VAR Analysis.
Contribution 9	Yuan, X.; Yu, L.; Wu, H. Awareness of Sustainable Development Goals among Students from a Chinese Senior High School.
Contribution 10	Hernández-Ramos, J.; Pernaa, J.; Cáceres-Jensen, L.; Rodríguez-Becerra, J. The Effects of Using Socio-Scientific Issues and Technology in Problem-Based Learning: A Systematic Review.

References

1. Yáñez, S.; Uruburu, Á.; Moreno, A.; Lumbreras, J. The Sustainability Report as an Essential Tool for the Holistic and Strategic Vision of Higher Education Institutions. *J. Clean. Prod.* **2019**, *207*, 57–66. [CrossRef]
2. General Assembly of United Nations Transforming Our World: The 2030 Agenda for Sustainable Development. Available online: https://documents-dds-ny.un.org/doc/UNDOC/GEN/N15/291/89/PDF/N1529189.pdf?OpenElement (accessed on 17 August 2022).
3. Chenery, H.; Ahluwalia, M.S.; Bell, C.L.G.; Duloy, J.H.; Jolly, R. *Redistribution with Growth: Policies to Improve Income Distribution in Developing Countries in the Context of Economic Growth*; Oxford University Press: London, UK; Washington, DC, USA, 1974; ISBN 9780199200696.
4. General Assembly of United Nations United Nations Millennium Declaration. Available online: https://digitallibrary.un.org/record/422015/files/A_RES_55_2-EN.pdf?ln=es (accessed on 26 July 2022).
5. Leal Filho, W. Viewpoint: Accelerating the Implementation of the SDGs. *Int. J. Sustain. High. Educ.* **2020**, *21*, 507–511. [CrossRef]
6. Sachs, J.D. From Millennium Development Goals to Sustainable Development Goals. *Lancet* **2012**, *379*, 2206–2211. [CrossRef]

7. Dlouhá, J.; Pospíšilová, M. Education for Sustainable Development Goals in Public Debate: The Importance of Participatory Research in Reflecting and Supporting the Consultation Process in Developing a Vision for Czech Education. *J. Clean. Prod.* **2018**, *172*, 4314–4327. [CrossRef]
8. Zamora-Polo, F.; Sánchez-Martín, J. Teaching for a Better World. Sustainability and Sustainable Development Goals in the Construction of a Change-Maker University. *Sustainability* **2019**, *11*, 4224. [CrossRef]
9. Crespo, B.; Míguez-Álvarez, C.; Arce, M.E.; Cuevas, M.; Míguez, J.L. The Sustainable Development Goals: An Experience on Higher Education. *Sustainability* **2017**, *9*, 1353. [CrossRef]
10. González-Gómez, D.; Jeong, J.S. Approaches and Methods of Science Teaching and Sustainable Development. *Sustainability* **2022**, *14*, 1546. [CrossRef]
11. Ferrer-Estévez, M.; Chalmeta, R. Integrating Sustainable Development Goals in Educational Institutions. *Int. J. Manag. Educ.* **2021**, *19*, 100494. [CrossRef]
12. Fia, M.; Ghasemzadeh, K.; Paletta, A. How Higher Education Institutions Walk Their Talk on the 2030 Agenda: A Systematic Literature Review. *High. Educ. Policy* **2022**, 1–34. [CrossRef] [PubMed]
13. Murillo-Vargas, G.; Gonzalez-Campo, C.H.; Brath, D.I. Mapping the Integration of the Sustainable Development Goals in Universities: Is It a Field of Study? *J. Teach. Educ. Sustain.* **2020**, *22*, 7–25. [CrossRef]
14. Zamora-Polo, F.; Sánchez-Martín, J.; Hipólito-Ojalvo, F. Using Moral Dilemma for Ethical Skills Development in Engineering Degrees. Application to Mechanical Engineering. *Dyna Ing. Ind.* **2016**, *91*, 495–497. [CrossRef]
15. Zamora-Polo, F.; Román-Suero, S.; Sánchez-Martín, J. From Efficiency to Sustainability. Training Responsible Engineers in the New Educational Scene. *Dyna Ing. Ind.* **2010**, *85*, 575–580. [CrossRef]
16. Sá, M.; Serpa, S. Transversal Competences: Their Importance and Learning Processes by Higher Education Students. *Educ. Sci.* **2018**, *8*, 126. [CrossRef]
17. Zamora-Polo, F.; Sánchez-Martín, J.; Corrales-Serrano, M.; Espejo-Antúnez, L. What Do University Students Know about Sustainable Development Goals? A Realistic Approach to the Reception of This UN Program amongst the Youth Population. *Sustainability* **2019**, *11*, 3533. [CrossRef]