Higher Education Institutions transforming societies through Sustainable Development: the comprehensive approach of the University of Bologna

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1. Higher Education Institutions and Sustainable Development

In a time of fast changing paradigms, the role of Higher Education Institutions (HEIs) in finding feasible solutions to global challenges is being questioned[1]. Arguably, the Covid-19 pandemic has enhanced the need for societies and decision makers to rely on science and to address academia to draw pathways on one side to manage emergency situations, on the other to design more sustainable models.

In this light, sustainable development (SD), as a universal goal aimed at bringing prosperity to societies, shall be comprehensively integrated within the actions of HEIs[2]. In the first place sustainable development has increasingly been embodied in university curricula[3], and recently also beyond the traditional fields of environmental studies[4], impacting to different extents the teaching methods and the approaches to disciplines[5]. In the second place, HEIs have been requested to focus research efforts in the field of SD, as clearly emerges from the well-known resolution of the United Nations General Assembly "The Future We Want"[6], even though, from the opposite perspective, barriers

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[1] Rosni Bakar and Aziah Ismail, *Sustainability of Higher Education: A Global Perspective*. (2019). EBSCOhost Ebook Academic Collection - World Wide.

[2] Walter Leal Filho, Evangelos Manolas, and Paul Pace, "The future we want: key issues on sustainable development in higher education after Rio and the UN decade of education for sustainable development", *International Journal of Sustainability in Higher Education*, Vol. 16 no. 1 (2015): 126. http://dx.doi.org/10.1108/IJSHE-03-2014-0036.

[3] Arnim Wiek, Lauren Withycombe, and Charles L. Redman, "Key competencies in sustainability: a reference framework for academic program development", *Sustainability Science*, Vol. 6 no. 2 (2011): 203-204, https://doi.org/10.1007/s11625-011-0132-6.

[4] Yen Chun Jim Wu and Ju Peng Shen, "Higher education for sustainable development: a systematic review", *International Journal of Sustainability in Higher Education*, Vol. 17 no. 5, (2016): 634-635, https://doi.org/10.1108/IJSHE-01-2015-0004.

[5] Naomi T. Krogman, and Apryl Bergstrom, "Sustainable Higher Education Teaching Approaches, in *Handbook of Engaged Sustainability,* ed. Joan Marques (2018), 445-448.

[6] United Nations, "A/RES/70/1 Resolution adopted by the general assembly on 25 September 2015", (UN General Assembly 2015): par. 235. Available at: www.un.org/sustainabledevelopment/.

to innovation and sustainability have been acknowledged in a variety of contexts[7] [8]. Hence, it has been demonstrated how the HEIs activities on sustainability in their missions of teaching and research present social, economic, and environmental impacts[9].

While a contribution of universities to SD has been provided since the past century[10], the year 2015 marked a significant turning point with a huge bearing on the relationship between SD and HEIs in the implementation of the Sustainable Development Goals (SDGs)[11], as became evident since the negotiation process[12]. This relationship goes far beyond the achievement of SDG n. 4, which asks to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" and clarifies the significant role Universities play in the implementation of the majority of the SDGs[13].

In addition to the core missions of HEIs, positive results have been demonstrated by the integration of the SDGs in universities third mission, referring to its impact on the socio-economic context and stakeholders[14], governance, and management[15] [16].

However, in this light it is significant to consider that there is not a full understanding of a framework for the sustainability management of universities[17] while there is the need for a universal sustainability assessment in higher education[18].

This paper aims to provide a concrete contribution on how the impact of HEIs in positively transforming societies shall go through a full embracement of sustainability by the Universities, going beyond teaching or research matters, and becoming a driving

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[7] Lucas Veiga Ávila et al., "Barriers to innovation and sustainability in universities: an international comparison", *International Journal of Sustainability in Higher Education*, Vol. 20 no. 5, (Emerald 2019): 807. https://doi.org/10.1108/IJSHE-02-2019-0067.

[8] Walter Leal Filho et al., "Identifying and overcoming obstacles to the implementation of sustainable development at universities", *Journal of Integrative Environmental Sciences*, 14:1, (Taylor&Francis 2017): 93-95. https://doi.org/10.1080/1943815X.2017.1362007.

[9] Himani Gupta and Neeraj Singhal, "Framework for embedding sustainability in business schools: a review", *The Journal of Business Perspective*, Vol. 21 no. 2, (Sage 2017): 195-198, https://doi.org/10.1177/0972262917700993.

[10] Luis P. Amaral, Nelson Martins, Joaquim B. Gouveia, "Quest for a sustainable university: a review", *International Journal of Sustainability in Higher Education*, Vol. 16 no. 2, (2015): 156.

[11] United Nations, "A/RES/70/1 Resolution adopted by the general assembly on 25 September 2015", (UN General Assembly 2015). Available at: www.un.org/sustainabledevelopment/.

[12] Felix Dodds, David Donoghue, Jilema Leiva Roesh, *Negotiating the Sustainable Development Goals A transformational agenda for an insecure world* (London: Routledge 2016).

[13] Angelo Paletta et al., "Adoption of the SDG as a Reporting Framework at the Alma Mater Studiorum (University of Bologna) in Italy", in *Sustainable Development Goals and Institutions of Higher Education*, eds. Godwell Nhamo, Vuyo Mjimba (Cham: Springer, 2020): 187.

[14] Angelo Paletta, and Alessandra Bonoli. 2019. "Governing the University in the Perspective of the United Nations 2030 Agenda: The Case of the University of Bologna.", *International Journal of Sustainability in Higher Education*, vol. 20 n. 3: 508. https://doi:10.1108/IJSHE-02-2019-0083.

[15] Godwell Nhamo and Vuyo Mjimba, "The context: SDGs and Institutions of Higher Education", in *Sustainable Development Goals and Institutions of Higher Education*, eds. Godwell Nhamo, Vuyo Mjimba (Cham: Springer, 2020): 6.

[16] Giselle Weybrecht, "From Challenge to Opportunity – Management Education's Crucial Role in Sustainability and the Sustainable Development Goals – An Overview and Framework.", *International Journal of Management Education*, Vol. 15, no. 2 (2017): 92, http://doi.org/10.1016/j.ijme.2017.02.008.

[17] Samantha Adams Becker et al., *NMC Horizon Report: 2017 Higher Education Edition* (Austin, Texax: The New Media Consortium, 2017): 4.

[18] Antonios Maragakis, Andy van den Dobbelsteen, and Alexandros Maragakis, "Stakeholders Perceptions of a Universal Sustainability Assessment in Higher Education--A Review of Empirical Evidence", *International Journal of Higher Education*, Vol. 5, no. 4 (2016): 251, https://doi.org/10.5430/ijhe.v5n4p247.

transformative force that starts from a systemic and comprehensive approach. Hence, the case of the Alma Mater Studiorum – Università di Bologna (UNIBO, hereinafter also Alma Mater) will be showcased to prove that an internal process of innovation can effectively lead to an increased impact on relevant stakeholders and communities. After a brief scrutiny of the context wherein this approach has been shaped, empirical cases of strategic actions carried out by the institution will be outlined with a focus on their purposes and some methodological notes. The discussion will hence highlight some findings and learned lessons before the conclusions will be drawn.

2. The context of the Alma Mater Studiorum – University of Bologna: from a political commitment to a comprehensive approach

The Alma Mater Studiorum – Università di Bologna, established in 1088 A.D. and hence acknowledged as one of the most ancient HEIs of the Western world, today is a prominent mega-University in the European and international scenario with 87,758 enrolled students, personnel over 5,733 units (2,771 academics and 2,962 administrative employees), and a structure of 1,162,506 m^2 of facilities in five campuses[19] and in some international offices. Given the size of its community, the geographical spread at the local, national and international level, and its mandate of producing and transferring knowledge through and on human capital, the Alma Mater has acquired increasing awareness of its social, economic, and environmental impacts.

Since 2009 the institution has hence started a sustainability process, implementing actions and measures mainly concerning the impact on the environment of its operations and adopting "UNIBO Green", the Energy and Environmental Sustainability Plan with a three years perspective.

The measurement of its environmental print has soon become insufficient considering the level of complexity in governing and managing the university. Therefore, the pressing need and duty to harmonize the relationship within the university community and the one between the people and the wider environment has led to an evolutionary pathway toward sustainability which values its economic, social, and ethical aspects.

In the following years, a forward-looking and multidisciplinary vision has indeed been driving the governing bodies and units in the analysis of the university performance while including a deep reading of the connection of the institution and all its stakeholders.

A series of documents and tools with strategic, monitoring and reporting aims have been designed and drafted through a continuous process of methodological betterment, participative processes and communication plans addressing both the university community and the external one. Thus, since 2012, a vast Social Responsibility Report is drawn up every year reaching its 7th edition in 2020 with the eloquent title "Competence – Commitment – Community"[20]. From 2015 a Gender Equality annual report has been issued together with a Gender Equality Plan[21].

The momentum has then been then reached with the introduction of the SDGs as a cross-

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[19] "The University today: Numbers and innovation University of Bologna", University of Bologna, last updated, November 15, 2019, https://www.UNIBO.it/en/university/who-we-are/university-today.

[20] "Social Responsibility Report 2018", University of Bologna, 2019, accessed July 8, 2020, https://www.UNIBO.it/en/university/who-we-are/Social-Responsibility-Report/copy_of_social-Responsibility-report

[21] Tullia Gallina Toschi, "*PLOTINA: WP2: Gender Assessment, Gender Equality Plans (GEPs) Design and Lessons Learnt: Task2.5: Quantitative Gender Audit (GA) Data: University of Bologna (IT)*.". (University of Bologna, 2017). http://www.dx.doi.org.ezproxy.UNIBO.it/10.6092/UNIBO/amsacta/5568.

cutting dimension of the university Strategic Plan 2016-2018[22]. This three-year programming document, required by national legislation, outlines both the strategic objectives related to the institutional missions and the operational ones addressing its administration as a direct responsibility of the management structure. In the first experience of setting SD at the center of the governance action, each objective has been associated with one or more goals identified by the 2030 Agenda. The absence of a complete and systematic collection of data correlated to the objectives on the 17 SDGs brought some issues on the concrete application of such a plan. This acknowledgment, combined with the hosting by the City of Bologna of the Environment Ministerial Meeting of the G7 in 2017[23], led to the adoption of the SDGs as a reporting framework which will be later illustrated.

A step forward was therefore moved with the Strategic Plan 2019-2021[24], in which sustainability as pictured by the SDGs, has been set as a comprehensive development strategy for the entire institution, its departments, campuses, and centers[25]. Therefore, the governance of the university has oriented its action toward sustainability by redesigning institutional strategies, rethinking operative structures and management models, and strengthening its accountability towards the stakeholders.

The political commitment has been complemented by empirical findings and inputs from its broad community and its networks, and has been translated into concrete tools of planning, management, and reporting.

3. From commitment to action: overview on the elements of the approach

3.1 The Report on UN Sustainable Development Goals and AlmaGOALS

As a result of the process of integration of the SDGs in the strategic planning and their spread in all the university activities, the Alma Mater has developed an additional tool for reporting on extended performance, which is flanked by the Social Responsibility Report and the Gender Report. The document, titled "Report on U.N. Sustainable Development Goals"[26], is aimed at: i) systematically documenting and therefore monitoring all activities, projects and initiatives with implications on the spheres of each SDG; ii) measuring their direct and indirect impacts on each SDG; iii) providing a considerable run of comparable data through an innovative reporting system.

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[22] "Strategic Plan", University of Bologna, accessed July 10, 2020, https://www.UNIBO.it/en/university/who-we-are/strategic-plan.

[23] Angelo Paletta et al., "Universities, Industries and Sustainable Development: Outcomes of the 2017 G7 Environment Ministerial Meeting", *Sustainable Production and Consumption*, vol. 19 (July 2019): 1-2. https://doi:10.1016/j.spc.2019.02.008.

[24] "Strategic Plan", University of Bologna.

[25] Paletta et al., "La sostenibilità come strategia di sviluppo degli atenei: il caso dell'Università di Bologna", *Impresa Progetto - Electronic Journal of Management*, Vol. 1 (2018): 12. https://www.impresaprogetto.it/sites/impresaprogetto.it/files/articles/ipejm_-_1-2018_-_paletta.pdf

[26] "Reporting on the U.N. Sustainable Development Goals", University of Bologna, accessed July 10, 2020, https://www.UNIBO.it/it/ateneo/chi-siamo/reporting-on-united-nations-sustainable-development-goals-1.

Fig. 1 Summary of the Report on UN Sustainable Development Goals 2019

The Report is compiled by an innovative methodological approach used to define the direct and indirect impact of the university's activities in the four performance dimensions of the Alma Mater - training, research, third mission and institution – and to measure their contribution to the advancement of all the SDGs. Figure 1 shows how the summary appears in 2018 edition, linking overall data and description, and intuitive graphic signs to make the reading accessible, immediate, and appealable.

A specific Scientific and Technical Committee for Social Reporting composed by Professors, researchers and staff members defines and verifies the methodology organizes all the operations required to guarantee the highest degree of accountability of the final product. This process constitutes a remarkable example of interdisciplinarity and cross-sectoral collaboration among the members of the university community: the exchange is conducted on the theoretical ground as well as the practical one. The composition of the Committee makes these aspects explicit, since it comprehends the Rector, Rector Delegates, those in charge of representing the university in national and international networks, the Director General, and some heads of administrative divisions: ARAG - Finance and Subsidiaries Division; APOS - Personnel Division; AUTC - Buildings and Sustainability Division; ARTEC - Corporate Relations, Third Mission and Communication Division. Recently the Committee has been joined by a student representative as well. The drafting is then supported by the Evaluation and Strategic Planning Unit and the Communication Unit.
In describing the collaborative features of the university comprehensive approach to sustainability, it is pertinent to point out that the same Committee is also in charge to compile the Social Responsibility Report and the Gender Equality Plan and its report.

To complete the explanation of the designing process of the Report, it is usually redacted from April to June, considering the effort in collecting and elaborating data, which always refer to the antecedent calendar year, except for those related to training which refer to the previous academic year[27].

As of today, the Report has been issued four times, with reference to years 2016, 2017, 2018, and 2019. For the purpose of this discussion, further reference will be made to the last edition 2019[28], which was prepared from April 2019 to July 2020.

Moving to the methodological specifics, numerical indicators have been selected to present the university actions and initiatives regarding the four performance dimensions on all 17 SDGs. For each SDGs both quantitative and qualitative information is organized

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[27] Ibid.

[28] "Report on the U.N. Sustainable Development Goals 2018", University of Bologna, accessed July 12, 2020, https://www.UNIBO.it/it/ateneo/chi-siamo/reporting-on-united-nations-sustainable-development-goals-1.

according to criteria specifically drafted to match and integrate the institutional documents adopted by the university[29] through the illustration of data as per in Fig. 1 and specific focus boxes.

The quantitative data are provided in particular from the University Data Warehouse, a database unit designed by the management systems of the Alma Mater, while qualitative information is collected by ad hoc surveys, content analysis, SCOPUS queries, and through extensive collaborative interactions between departments and administrative structures.

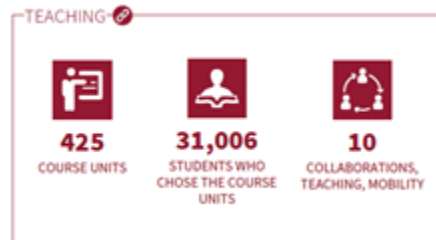For a better understanding of the document, some clarifications deserve attention.

Fig. 2 Box on Teaching related to SDG 8 'Decent work and economic growth'

First, the training dimension is reported measuring three primary indicators: a) course units, b) students, and c) teaching collaborations. Each a) course unit is linked to one or more SDGs, recorded through a survey administered to Professors to select the SDGs related to their teaching unit. b) Students represent those who chose to attend a course unit associated with the SDGs. c) The number of teaching collaborations states the quantity of active teaching and mobility projects. Finally, when available and relevant, qualitative information is described. Figure 2 shows by means of example the results related to SDG 8. The section dedicated to SDG 4 reports the parameters used to analyze quality education.

Fig. 3 Box on Research related to SDG 3 'Good health and well-being'

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[29] Paletta et al., "Adoption of the SDGs", 190-191.

Second, the dimension of research presents six main indicators and some significant described actions. These first are: publications in Scopus, "cited by" in Scopus, H-index, publications per capita with an international and a national benchmark, and the number of working research projects for the relative year under the European Union (EU) 7th Framework Programme for Research and Technological Development (FP7)[30] and the Horizon 2020 framework (H2020)[31].

The amount of publications is extracted from the Scopus database, considering articles from the last five years, by authors affiliated to the University of Bologna, and that respond to a set of keywords specifically drafted by the Committee. Starting from the 2019 Report, as shown in figure 3, the document indicates two different results for research data, based upon two different sets of keywords. This shift is intended to consider a new dual way of benchmarking with other universities:

- one represents the outcome of the University of Bologna set of keywords, determined for each UN SDG by considering the general declaration of the Goals and all targets of each SDG;
- the other is determined by using a set of Scopus queries related to each SDG, except for the number 17 "Partnership for the Goals", generated by Elsevier.

This approach for some Research information also affects the citations count and the calculation of the H-index which both maintain the two different outcomes. Subsequently, also the number of "cited by" and the H-Index are affected by the two group of keywords. This quantity represents the number of documents that have cited the author for a document's publication in the DB Scopus. Then, the H-Index, which is used to measure the scientific output of the University of Bologna. This figure was developed by the physician Jorge Eduardo Hirsh and it counts the highest number of articles that present at least the same number of citations. It expresses an easy to read 1:1 relationship between publishing articles and citations[32].

With the purpose of comparing the results of the University of Bologna with other similar institutions, two different kinds of benchmark are conducted. The first refers to the top 10 European Universities and the second to Italian Institutions which are in the first 400ths, both ranked in QS World Universities Ranking[33] and that are comparable to the University of Bologna in terms of: Size (XL - which means more than 30,000 students), Focus (FC - all 5 QS faculty areas, including medicine faculty), Research Intensity (Very High - more than 13,000 publications in the last 5 years), Status (Public).

In the last place, for each SDG the University of Bologna's ratio is related to the average of the ratios for the ten universities in the benchmark group and for the Italian universities. The outcome is the index number "benchmark = 100". Consequently, a number higher than 100 states that "per capita publications" by the University of Bologna academics is greater than the average of the universities in the benchmark. On the other hand, if the index is lower than 100, academic productivity of the University of Bologna is also minor than the benchmark[34].

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[30] European Union Parliament and Council, Decision n. 1982/2006/EC.

[31] European Union Parliament and Council, Regulation n. 1291/2013.

[32] "Reporting on UN SDGs", University of Bologna.

[33] "QS world universities ranking", QS Quacquarelli Symonds Limited, accessed July 15, 2020, https://www.topuniversities.com/qs-world-university-rankings.

[34] Paletta et al., "Adoption of the SDGs", 191.

Fig. 4 Highlight of Third Mission and teaching projects in the 2019 edition

The Third Mission impacts are reported by considering and featuring the role of the University toward the communities and societies it insists on or interacts with. It primarily indicates the quantity of cooperation, social engagement research projects that are active worldwide. It also contains lifelong learning programs as well as the number of spin-offs and start-ups born by academic entrepreneurship processes, and events with engagement from the public. Thus, third mission impact is reported in different ways (boxes, graphs, and texts) for each SDG according to the nature of the considered activities. Figure 4 displays a sum-up of all the activities and projects reported in the last edition of the report.
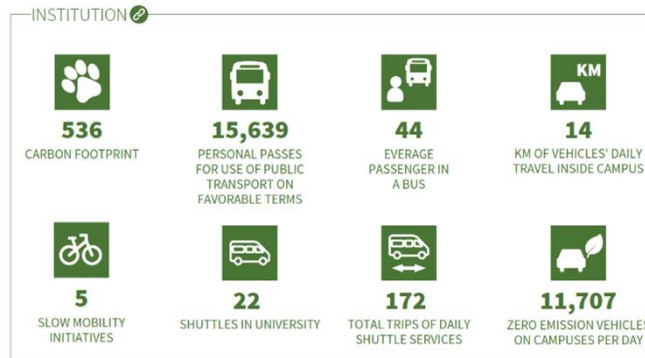

Fig. 5 Box on Institution related to SDG 13 'Climate action'

Finally, the institutional actions are measured reflecting the environmental performances as well as indicators connected to actions addressing the internal community. As explained for the previous section, also the display of the institutional dimension varies in relation to each SDG. In a non-exhaustive list, some of the collected data are the following: [SDG 3] unit (number) of UNIBO staff (teacher and researcher, Administrative and Technical (TA) who spends part of their job in university hospitals or in health facilities in agreement; indicators of economic performance and economic-financial sustainability index; [SDG 5] distribution by gender of the members of the governing bodies of the University; University glass ceiling index (and comparison 2014, 2015, 2016); [SDG 6] water consumption per year and percentage of devices with water efficiency installed at the University; [SDG 7] green roofs m^2 on Alma Mater facilities; renewable energy amount per year (mwh) and percentage of conventional devices replaced with other energy efficient.

The annual issuing of the Report is also complemented by AlmaGOALS[35], an on-line open access platform that displays the contents of the Report vehiculating the university commitment to the SDGs. The platform functions as a dynamic tool that is regularly updated and enriched with focuses and links of each reported data. AlmaGOALS blends an integrated fruition by dimensions or goals and completed by communication materials.

3.2 The international dimension: AlmaENGAGE

The international vocation of the Alma Mater has rooted in its history and constitutes an intrinsic characteristic of its missions. As in Cho[36], since universities are increasingly opening their institutions to the outside world and more engaged in social and public issues, they are sharing their knowledge to the benefit of society.

In this regard, the University of Bologna, aiming at giving answers to those needs, and being involved in the development cooperation as a key activity that unites internationalization and social commitment, has created the AlmaENGAGE structure which coordinates and harmonizes those activities at local and an international level. Through AlmaENGAGE, the University organizes a variety of awareness-raising initiatives for academic and non-academic stakeholders and establishes partnerships with NGOs and GOs to explore new opportunities for student mobility within development cooperation projects[37].

AlmaENGANGE's activities are meant to involve students in extracurricular activities by encouraging them to play an active role on issues of public interest related to development cooperation and social engagement, therefore contributing to foster their professional growth and to strengthen soft skills that are increasingly necessary today in a globalized society.

In particular, the Field Work international mobility program is a rather new chance for students to spend a period with NGOs or other entities active in grassroots projects, carrying out on-the-field activities in developing or undeveloped countries. Another praiseworthy initiative is UNIBO4Refugees, which allows refugees to become students at the University of Bologna thanks to financial support and personal education plans. Furthermore, the UNIversity COrridors for REfugees (Ethiopia-UNIBO 2019-21) represents a relevant action towards the international cooperation which lets asylum seekers students from Ethiopia to continue their academic career at the University of Bologna[38].

3.3 The internal transformation: Sustainable Multicampus framework

Considering the intricacy of a widespread campuses system in different and diverse geographical areas, the scholarly attention for both campus operations and campus experience[39] fits very well the case of the Alma Mater.

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[35] "AlmaGOALS", University of Bologna, accessed July 15, 2020, https://site.UNIBO.it/almagoals/en.

[36] Young Ha Cho, "Towards an Engaged Campus: Measuring and Comparing Definitive Stakeholders' Perceptions of University Social Engagement in South Korea.", *International Journal of Sustainability in Higher Education* Vol.18, no. 2 (2017): 189, https://doi.org10.1108/IJSHE-12-2015-0194.

[37] "About us - AlmaENGAGE", University of Bologna, accessed July 15, 2020, https://site.UNIBO.it/almaengage/en/about-us.

[38] "UNI-CO-RE. University corridors for refugee students in Ethiopia", University of Bologna, accessed July 10, 2020 https://site.UNIBO.it/almaengage/en/projects/unicore-humanitarian-corridors.

[39] Florian Findler et al., "The impacts of higher education institutions on sustainable development A review and conceptualization", *International Journal of Sustainability in Higher Education* Vol. 20 no. 1 (2019): 30. https://doi.org.10.1108/IJSHE-07-2017-0114.

Among the initiatives contributing to SD, a higher degree of practicality can thus be ascribed to the Sustainable Multicampus framework. The framework has been conceived to respond to the environmental impacts of the university, further considering the containment of consumption that affect the building complexes, sites, mobility, while safeguarding and nurturing the built heritage and the well-being of the members of the university community. It focuses on managing and operating the multi-campus system with SD principles by combining economic development, social inclusion, and environmental sustainability. This strategy plans, tests and implements new management models organized in four fields: Energy, Environment, Mobility and People. The latter is pivotal since it focuses on the needs and the habits of the university community by connecting with the other fields. Thus, it puts them in direct relation to the human context, tackling matters like sustainable food, health and wellbeing, sport, and social and cultural sustainability. This relation enables a reciprocal exchange among management tools and environmental policies, contributing to improving the overall well-being of the community living in the university spaces and promoting an increasingly greener community. This means caring environmental protection through more active and responsible behaviors and satisfying the demands of a sustainable approach as a principle for the development of a society aimed at respecting public ethics and the well-being of the individuals[40].

Within this framework, in 2019, after the experimentation conducted at the Department of Civil, Chemical, Environmental and Materials Engineering[41], the Alma Mater established two Green Offices. This initiative brings together all the components of the university community - students, technical-administrative staff, and lecturers - to implement new sustainability projects and models. The Green Offices are unique student-led sustainability hubs that help universities to involve the community and its energies to concretize the will to link the future of sustainability strategies to the young people who will benefit from them[42] [43].

The two Green Offices cover all the campuses: one is based in the City of Bologna and the other in the City of Forlì; each is composed of 1 coordinator, 8 students appointed by the Student Council, 2 teachers and 4 technical-administrative staff members. They are divided into four working groups (communication, projects, events, and networking) that coordinate all the actions through a creative and innovative attitude[44].

[40] J. Aaron Hipp et al., "The relationship between perceived greenness and perceived restorativeness of university campuses and student-reported quality of life", *Environment and Behavior*, Vol. 48 no. 10 (2016): 1293-1294. https://doi.org/10.1177/0013916515598200.

[41] Gabriella Calvano, Angelo Paletta, and Alessandra Bonoli, "How the Structures of a Green Campus Promotes the Development of Sustainability Competences. The Experience of the University of Bologna", in *Sustainability on University Campuses: Learning, Skills Building and Best Practices,* eds. Walter Leal Fhilo and Ugo Bardi. (2019): 40.

[42] Felix Spira and Sirkka Tshiningayamwe, "Scaling ESD", in Issues and trends in Education for Sustainable Development, eds. Alexander Leicht, Julia Heiss, and Won Jung Byun (Paris: UNESCO Publishing, 2018), 209.

[43] Roman Lehnhof and Cathy Nolan, "The Green Office Model: making universities more sustainable", UNESCO ED/PSD/ESD/2016/PI/7 (2016): 1-3. https://unesdoc.unesco.org/ark:/48223/pf0000245763.

[44] "GOAL – Green Office Alma Mater", University of Bologna, accessed July 27, 2020, https://site.UNIBO.it/multicampus-sostenibile/it/green-office.

4. Discussion and findings

The Alma Mater comprehensive approach to sustainability in the perspective of the Sustainable Development Goals generates virtuous processes with implications on one hand on the internal sphere of the university and on the other on the external one.
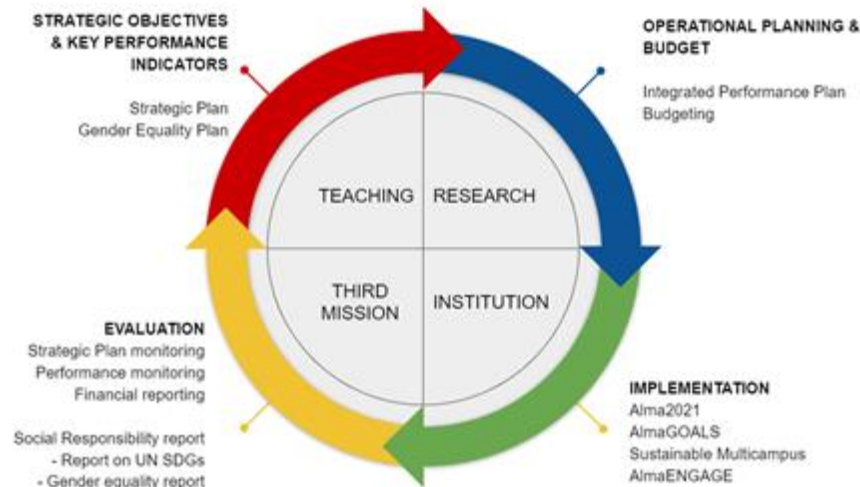

Fig. 6 Cycle of sustainability at the Alma Mater Studiorum – Università di Bologna

To design and embrace a holistic approach that includes all the dimensions of the university, overcoming the traditional distinctions among the missions and crossing scientific fields has shown its efficacy in advancing the sustainability of the institution itself. Figure 6 simplifies the cycle of sustainability retracing the line of reasoning followed until this point, by displaying the broader picture where the described actions are to be inscribed. Strategic objectives and key performance indicators are set by the Strategic Plans, and the GEP, and then translated into operational planning: the Integrated Performance Plan rules over the management operations of the technical administrative divisions run by the Director General, while the budget allocates resources. The means of implementations are coordinated by the open access platform Alma2021[45], which sets the vision of development for the Alma Mater and the relative actions. The illustrated actions (AlmaGOALS, AlmaENGAGE and the Sustainable Multicampus Framework) then collects the single initiatives and projects to complete the set.

An in-depth evaluation is then carried through the corresponding monitoring of the set objectives. The monitoring tackles the objectives of the governance (Strategic Plan monitoring), the management (Performance monitoring), as well as the financial ones (Financial reporting), and is complemented by the specific tools on sustainability.

From integrating the SDGs into the major strategies of the university as a complex organization, the implementation of those strategies is fed by creative life forces the entire community is entitled and empowered to contribute to. The application of the SDGs and its targets within the institution allowed on one hand to catalyze a process of basic literacy on sustainability and of inner dissemination of SD culture. This point is confirmed by the

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[45] "Alma2021", University of Bologna, accessed July 19, 2020, http://alma2021.unibo.it/en

fact that education on sustainable development (ESD) is currently being included into the mandatory training for new employees.

At the same time, developing tools to monitor and then evaluate performances in terms of sustainability is highly increasing the accountability of university units and structures, and therefore their future accomplishments. Following a positive trend, more ambitious goals can be set and therefore all the present and future components of the institution can benefit from this internal process of paradigms shifting.

However, it is appropriate to specify a few weaknesses. As an ongoing process, subject to the constant transformations of the society in a globalized world, the methodologies are to be regularly sharpened. Applicable indicators need to be adjusted to offer comparable results and confront the hardship in collecting and elaborating data. A useful example is offered by the recent discussion on the necessity to anticipate the annual issuing of the Report on the UN SDGs to harmonize its dissemination with that of other reporting documents with the aim to provide an updated and timely picture of the university results. Functional findings highlighted by the governance of the university sometimes encounter resistances in terms of practical feasibility.

Dealing with external implications of the approach, findings have demonstrated over the years a strengthening of the accountability towards all the relevant stakeholders. In the first place among other HEIs, the Alma Mater has greatly contributed to the birth of new positive networks, at both the international and national level. Internationally, UNA Europa has been established in 2019 as an alliance of eight European universities to build an inter-university campus[46]. Furthermore, the university has recently been admitted into the UN Sustainable Development Solution Network (UN-SDSN) and put forward its candidacy as an entity with special consultative status at the United Nations Economic and Social Council (UN ECOSOC).
Nationally, the Alma Mater has contributed to the establishment of RUS – Italian University Network for Sustainable development [47] [48].
The network represents a tool for coordination and sharing among all Italian universities committed to sustainability in all its shades. The main purpose of the Network is to spread the culture and good practices on SD, both inside and outside the Universities and to strengthen the recognition and value of the Italian experience at international level. The RUS also represents a model of good practice to be extended to other sectors of the Public Administration and education and the territory in general, encouraging the development of collaborations between universities and cities, by spreading social innovation and providing cultural stimuli for the entire country system. In second place, this objective also includes different entities from the HEIs. To this extent a new project on the drafting of a Metropolitan Agenda for Sustainable Development 2.0 is being conducted with a multi-level set of decision-making institutions; and another project aimed at outlining a sustainability report in a network perspective by identifying mutual stakeholders is being investigated with the Municipality of Bologna.

More remarkably, the commitment of the university has been rewarded by the results of the 2020 Times Higher Education ranking against the SDGs. The Alma Mater ranked 6th

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[46] "About UNA Europa", UNA Europa, acessed July 20, 2020, https://www.una-europa.eu/about

[47] Giulia Sonetti, Caterina Barioglio, and Daniele Campobenedetto, "Education for Sustainability in Practice: A Review of Current Strategies within Italian Universities." *Sustainability* Vol. 12, no. 5246 (2020): 2-3. doi:10.3390/su12135246.

[48] "About RUS", RUS, accessed July 20, 2020, https://sites.google.com/unive.it/rus/eng?authuser=0

in the world, among more than 500 HEIs for the contribution to the global goals, with a score of 96.1 out of 100 and more in details 3rd for SDG 16; 4th for SDGs 4, 5, and 8; and 10th for SDG 10[49].

4. Conclusions

Sustainable Development is an ambitious challenge that can be adopted by Higher Education Institutions through a systemic and comprehensive holistic approach. This includes the difficult process of questioning and rethinking their role in a fast-changing world, redesigning strategies, modifying teaching and research goals by remodeling organizational procedures and management models, and strengthening their accountability toward stakeholders.
At the beginning of the Decade of Action[50], this effort reveals to be more crucial than ever, on one side to create the most possible fertile environment for finding excellent solutions to global challenges, on the other side to ensure a long lasting sustainability of the universities themselves.

The novelty of the Alma Mater approach, and its comprehensiveness lies in its full and deep embracement of the 17 Sustainable Development Goals under a strong political will of the University governance.
While positive results are being collected year by year, a rising awareness of its perfectible nature is acquired. Hence, even stronger efforts are needed in improving the university preparedness and response to evolving scenarios at the local and the international level, in order to maintain a positive trend.
With full respect for the founding principles of freedom of teaching and research and of the autonomy of HEIs, a more significant opening and then engagement of the broad social fabric is pivotal: public sector institutions, the business sector and civil society organizations shall collaborate to finding innovative solutions towards sustainability to ensure benefits for the society as a whole.

Finally, the approach acquired by the University of Bologna can be function as either an inspiration or a model for other HEIs to drive collaborative solutions toward the rough path toward sustainability.

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