

**HIGHER
EDUCATION
SUMMIT**



20 24 **HIGHER EDUCATION SUMMIT**

CO-CREATING CHANGE FOR SUSTAINABILITY

September 8 - 10, 2024

Palazzo Bo, University of Padua, Italy

CONFERENCE PROCEEDINGS

Edited by

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Proceeding of 2024 Higher Education Summit Co-creating Change for Sustainability

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Welcome Note from the Scientific Committee

Co-Creating change for sustainability is the theme of the 2024 **Higher Education Summit** Conference!

This conference has been realized thanks to a strong partnership between Copernicus Alliance and the University of Padova, and the proper support and collaboration of the FISPPA department and of the University of Padova as well.

The goal of the 2024 **Higher Education Summit** (HES) conference is to inspire active participation of universities, students, educators, associations, policy makers representatives, and international experts in the development of a transformative culture for sustainability. Only through collective involvement and commitment we can facilitate the development of a collective sustainability mindset necessary for a sustainable future.

The Scientific Committee (SC) was responsible for designing and facilitating the conference proposal submission and review process. The HES 2024 Call for Papers received 122 proposals, each of which were reviewed by at least two reviewers and some by three.

The SC innovated its processes by organizing a team of nearly 35 reviewers into one of eleven Review Pods, led by Pod Leaders and supported by SC.

This process enabled the Review Pod Leaders to provide meaningful guidance to the reviewers in their pod and ensure that authors received detailed and useful feedback on their proposal. The Review Pod Leaders made the final recommendations on which proposals to accept for 2024HES Conference.

Thank you again to our committee members, reviewers and Pod Leaders for their dedication and commitment to our HES community!

Review Pod Leaders

We extend our immense gratitude to the following individuals for their contributions to the committee by serving as Review Pod Leaders:

- Marianne Grace Z. Araneta, University of Padova, Italy
- Francesca Bracci, Scientific Committee Co-Chair, University of Florence, Italy
- Joellen Coryell, Texas State University, USA
- Eleonora Di Maria, Scientific Committee Co-Chair, University of Padova, Italy
- Monica Fedeli, Conference Chair, University of Padova, Italy
- Mario Giampaolo, University of Siena, Italy
- Tom Kuppens, Scientific Committee Co-Chair, Hasselt University Brussel, COPERNICUS Alliance
- Marica Liotino, University of Padova, Italy
- Alessandra Romano, University of Siena, Italy
- Egl Staniškienė, Scientific Committee Co-Chair, Kaunas University of Technology, COPERNICUS Alliance
- Concetta Tino, Conference-Chair, University of Padova, Italy

Proposal Reviewers

Several scholars/experts were invited to review the proposals. We are grateful to the colleagues listed here, who accepted our invitation to review up to 5 proposals each.

Marianne Grace Z. Araneta	Monica Fedeli	Juliana Raffaghelli
Laura Bierema	Mario Giampaolo	Emilia Restiglian
Francesca Bracci	Elisabeth Hofmann	Alessandra Romano
Kim Ceulemans	Chad Hoggan	Burcu Simsek
Joellen Coryell	Tetyana Hoggan-Kloubert	Egl Staniškien
Anna Dalla Rosa	Juanita Johnson-Bailey	Edward Taylor
Estibaliz Saez de Camara	Rebeka Kovačič Lukman	Concetta Tino
Oleaga	Tom Kuppens	Simone Visentin
Eleonora Di Maria	Marica Liotino	Michael Winter
Jana Dlouhá	Ingrid Mulà	Anne Zimmermann
Regina Egetenmeyer-Neher	Aliki Nicolaides	Eleonora Zorzi

Scientific Committee Co-Chairs

- Monica Fedeli, University of Padova, Italy
- Concetta Tino, University of Padova, Italy

11 | Monitoring the integration of Sustainable Development into higher education teaching: a collaborative learning approach

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Abstract

Universities play a crucial role in promoting sustainability both within their own operations and in their broader communities. Sustainability reporting and assessment practices at Higher Education Institutions (HEIs) level have received increasing attention and various tools have been developed, diverse in their purpose, emphasis, and approach (Caeiro et al., 2020; Fischer et al., 2015). However, no consensus has yet been reached on exactly how to assess the integration of sustainability into curricula, as evidenced by the various assessment tools available to HEIs. The existence of different conceptualizations of “sustainability” complicates curriculum assessment because assessment presumes the ability to clearly qualify what is being assessed. Indeed, sustainability is a contested concept in constant transition, so assessing its integration is challenging (Stough et al., 2018). While embedding sustainability in curricula at the programme level has been discussed (Figueiró & Raufflet, 2015; Lozano et al., 2015), little research exists on the long-term monitoring of university-wide integration of sustainable development (SD) into teaching (Edwards et al., 2020). Moreover, (self-)reporting by institutions is often uncritical, or focuses on successes and achievements while omitting failures and problems (Holst et al., 2020), although failures have a strong learning potential. Carrying out meaningful monitoring of the integration of SD into teaching remains a challenge. Monitoring should ideally cover deep forms of SD-integration, involving teaching that goes beyond knowledge transfer and corresponds to “build-in” and “curriculum redesign” approaches (Sterling & Thomas, 2006) or even to the perspective of a Whole Institution Approach (UNESCO, 2014). The University of Bern’s monitoring experience offers valuable insights into the process of integrating SD into academic teaching, as it is designed to go beyond mere counting. Ultimately, the question is: how can universities enhance their sustainability initiatives and foster cross-institutional learning for greater impact? We argue for setting up institutional monitoring as a collective learning approach.

Our paper will briefly present the University of Bern’s journey towards integrating SD into teaching practices. We will then discuss how monitoring this integration in teaching has been re-conceived to enable greater adoption of SD by lecturers and faculties, while respecting the principle of academic freedom.

Grounded in theory, empirical research, and reflective insights, our study explores the complex organizational dynamics that underpin this integration process. By analyzing the roles, interactions, and challenges encountered at various decision-making levels within the university structure, we hope to offer insights for advancing SD integration in teaching in HEIs worldwide. Our research draws upon a mixed-methods approach, combining qualitative analysis with empirical evidence to provide a holistic understanding of SD integration in academic teaching. We used a case study methodology to assess the diverse range of actors involved in SD integration, from university leadership to individual lecturers, operating across macro, meso, and micro levels within the organizational hierarchy. By mapping out their roles, responsibilities, and power dynamics, we sought to uncover the mechanisms driving SD integration within the university. We then investigated how the monitoring and evaluation processes applied by the University of Bern helped increase the effectiveness of SD integration efforts. The analysis of the challenges encountered enabled us to identify opportunities for enhancing the monitoring framework and improving accountability mechanisms.

Our study highlights the importance of collaborative accountability in fostering a culture of sustainability within HEIs. In particular, we discuss how collaborative learning processes engaging stakeholders at all levels of the organization can drive continuous improvement and innovation in SD integration practices and pave the way for new action. Based on the analysis, we draw key insights and lessons learned from the University of Bern's experience and propose future directions for SD integration in HE, defined as six levers for the successful integration of SD in academic teaching. As we continuously want to learn and adapt our monitoring procedure, we look forward to a discussion of the six levers with conference participants and to learning from their experiences to further advance integration of SD in HE.

Our paper aligns closely with the conference theme by offering empirical research insights into the dimensions of the Whole Institution Approach (WIA) to sustainability. Through a blend of theory and practice, we provide evidence-based recommendations for making HEIs key actors of sustainability. Our presentation will contribute to the discourse on effective strategies for integrating SD into teaching practices, advancing collective understanding of sustainable organizational dynamics. Our presentation will also contribute to the ongoing debate on capacity building in HE by offering practical guidance and actionable recommendations for fostering a culture of continuous learning and professional development among staff members, with a focus on lecturers. We believe that investing in capacity building of staff is essential for driving meaningful change and advancing sustainability goals within HEIs and beyond.

Keywords

SD integration in HEIs, monitoring experience, curricula, case study University of Bern

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13 | The RESD Multi-Level Framework. A Proposal to Differentiate Types of Research and Education for Sustainable Development

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Abstract

The livelihoods of our present and future generations are threatened by pressing sustainability issues (Richardson et al. 2023). Science, i.e., research and education, plays a vital role in understanding sustainability problems and in providing solutions to cope with or solve them (Schneidewind et al. 2016). Yet, not all types of research and education contribute equally to sustainability transformations. Given the urgency of sustainability challenges, some demand that science must actively contribute to transformation processes towards sustainability and strengthen its societal impact (Loorbach and Wittmayer 2024). Therefore, it is important to discuss how different types of research and education for sustainable development (RESD) can be differentiated regarding their transformative potential and how to strengthen the types of RESD with high potentials for societal sustainability impacts.

Several authors have already proposed frameworks to differentiate types of RESD (e.g., Hugé et al. 2016; Independent Group of Scientists appointed by the Secretary-General 2019; Mochizuki and Yarime 2016). However, none of these frameworks have fully considered diverse aspects for differentiation and focus on the societal sustainability impact of RESD. We propose the Research and Education for Sustainable Development (RESD) Multi-Level Framework that distinguishes four types of RESD along key features that address different degrees of societal impact. The key features serve as proxies to assess the potential societal sustainability impact of RESD.

The aim of the framework is to build a transparent method to classify the SD impact orientation in research and education. The RESD Multi-Level Framework can be used to

- serve as a guideline for reflecting on higher education's institutional practices of research and teaching;
- enhance the visibility of science's and higher education's contributions to sustainability transformations;
- serve as a guideline for reporting on RESD;
- avoid "sustainability washing" in RESD;
- increase transparency for efficient and consistent funding of RESD;
- discuss the inclusion of RESD aspects into quality and evaluation criteria in science and higher education institutions (HEI);
- enable policymakers to support research and education with a high chance of societal impact toward a sustainability transformation.

Building on literature review and expert interviews, we identified existing frameworks and key features that differentiate various types of RESD. The project team critically discussed these frameworks and key features to create a framework differentiating RESD based on its potential societal sustainability impact. Several workshops with experts and other relevant stakeholders were held to further discuss types of RESD and the key features that differentiate them. Additionally, the workshops were used to review the development of the RESD framework.

Eight key features were identified to differentiate types of RESD. These key features include *content*, *modes* (referring to mono-, inter- or transdisciplinarity), *breadth of approach* (referring to systemic thinking, multiple perspectives and consideration of trade-offs/synergies), *potential for societal impact* and

apply to both research and education. The key feature *types of knowledge* which are generated (system, orientation, transformation knowledge) is only relevant for research. To enhance the societal sustainability impact of education, the key features *teaching approaches* (transmissive or participatory teaching), *levels of learning* (1st, 2nd or 3rd order learning) and *sustainability competencies* have been identified.

These key features were then used to differentiate four types of RESD. In terms of research, we differentiate *research with indirect reference to sustainability* with a low orientation towards societal sustainability impact. *Research with a focus on sustainability* focuses on sustainability impact on a science-to-science discourse, omitting the societal relevance. *Sustainability research in sensu stricto* has a higher potential for societal impact due to consideration of stakeholders. The highest potential for societal sustainability impact is attributed to *transformative research* due to its aim to actively initiate societal transformation processes.

For education, the following four types have been generated: *Education with indirect reference to sustainability* does not explicitly frame its content within a sustainability context and does not aim to educate sustainability change agents or promote sustainability competencies. In *Education about sustainability*, sustainability is added as a topic but has little societal sustainability impact due to its transmissive teaching approach. *Education for sustainability* focuses on acquiring competencies relevant for addressing with sustainability challenges, enabling learners to become active agents of change. *Transformative education* rethinks the entire education process, placing learners at the center and incorporating real-world contexts to empower them to become change agents for societal sustainability transformations.

To meet the global challenges, science and HEI must prioritize societal impact for sustainability. This requires reflecting on current research and education practices as well as their institutional conditions (Loorbach and Wittmayer 2024). The RESD multi-level framework offers a tool for assessing the potential societal sustainability impact of different types of RESD. This enhances the discussion on RESD, leading to increased transparency. Moreover, the RESD multi-level framework can support the development of targeted science policies such as guidelines for reporting on RESD or quality and evaluation criteria for RESD. These policies are crucial for supporting the institutionalization of transformative research and education, which are currently hindered by institutional barriers (Loorbach and Wittmayer 2024). Overall, the RESD multi-level framework aims to promote and strengthen research and education with a high change of societal sustainability impact. This enables science and HEI to become active change agents for sustainability.

Keywords

Sustainability research; education for sustainable development; sustainability impact; transformative science

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26 | Inner and outer dimensions integration in education for sustainability: Transformational change in worldviews, paradigms and behaviors

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Abstract

The scientific literature on the role that higher education institutions (HEIs) should play in the context of sustainability has increased considerably since the second decade of the 21st century (Hallinger and Nguyen, 2020), showing the interest and concern that this field of study arouses. Previous works have analyzed how HEIs are key elements in the sustainability paradigm, with education for sustainable development (ESD) being the pedagogical approach that has the most acceptance in the academic literature (Grosseck et al., 2019). ESD has become one of the international frameworks of reference when including the sustainability paradigm and Agenda 2030 (UN, 2015) in research and teaching in HEIs (Lukas, 2018).

However, according to Wamsler et al. (2021), addressing this situation within HEIs adequately will not be possible solely by applying technical and/or technological innovations (Wals, 2014). Feeney et al. (2023) emphasize that a deeper social and cultural transformation is still lacking. Additionally, this emerging social paradigm (Loorbach & Wittmayer, 2023) also reinforces the need for a new model of HEIs that ensures the transmission of knowledge and tools needed to address the sustainability dilemma, as well as the development of internal skills and capacities of students (Lilja et al., 2022) and teachers (Zguir et al., 2021; Wiek et al., 2011), facilitating opportunities for participation for all involved in the teaching-learning process through new pedagogical approaches within teaching and learning models. In this paper, we present the results of an experiential and experimental educational project for a master's degree at the University of the Basque Country (UPV/EHU) in Spain. We provide an innovative learning environment co-designed by an interdisciplinary international team of educators. This experiential learning program aims to improve students' employability in future jobs, aligning it with their personal identity and professional drive. We seek to provide a safe learning community to explore and further develop our students' leadership skills by engaging with multidisciplinary and multilingual teams and motivating each other to take action. We deploy knowledge, values, principles, and competences for sustainability within the framework of the Inner Development Goals (IDGs), adding value to SDG 4.7. Students work together with experts in sustainability and different disciplines, creating their own projects/devices/Master's theses inspired by their intrinsic motivation and purpose. To that end, we have taken as references the framework of Sipos et al. (2008), the United Nations Economic Commission for Europe (UNECE) 2012 framework, Theory U (Scharmer, 2017), and Systemic Thinking (Senge, 1993, 2006).

We apply hybrid research methods (Pöllänen et al., 2023) as a systematic learning process where students conduct critical analyses of the situations in which they have been immersed through metacognitive reflections and self-evaluations of IDG developments. We also present evidence on the impact that this pedagogical approach has had on the students, their professional environments, and the system. Based on our research results, the head, hands, and heart approach can collectively enable perspective and possibly behavioral transformation (Sipos et al., 2008). Regarding metacognitive reflections, it can assist students in exploring critical thinking and developing the skills needed to address sustainability dilemmas (Singel-Brodowski et al., 2022). In addition, experiential learning can help students understand what they learn by reconceptualizing it and applying it to their daily lives (Bianchi, 2020).

Keywords

Education for sustainability, experiential learning, skills for sustainability, Inner Development Goals - IDG-

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27 | Empowering students to work and live with a just and safe space for humanity – the journey of curricular sustainability at Hasselt University

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Abstract

This contribution outlines the ongoing journey of Hasselt University towards integrating sustainability competencies into its Educational Policy Plan 2022-2029. It highlights the pivotal steps taken, challenges faced and achievements made thus far.

Where it all began

In 2019 the journey started as a grassroots initiative of establishing a sustainability steering committee at Hasselt University, comprising students and both academic and operational staff. Triggered by a master student's aspiration for more sustainability at his university, this committee set forth a list of sustainability goals, inspired by the Whole Institution Approach, among which a goal to '*invest actively in letting grow a proactive sustainability engagement among students*'.

The momentum surged in 2020 with the appointment of a new rector, who introduced four transversal policy lines, including sustainability. This top-down support led to the formalization of the sustainability steering committee and the endorsement of the refined list of six WIA-inspired sustainability goals by the College of Deans in 2021. Notably, the educational goal is "Every student at UHasselt develops sustainability competencies".

A crucial step is becoming part of a policy plan

The official endorsement paved the way for its inclusion in the forthcoming Educational Policy Plan 2022-2029. To guarantee a bottom-up approach, diverse stakeholders were consulted for each thematic area and a dedicated task force, comprising colleagues from the faculties and the Educational Policy Directorate, was established. The following operational goals for sustainability were proposed in this Educational Policy Plan:

OO 3.1 Hasselt University will increase its focus on organising competency-based education via the Hasselt University competency framework, paying attention to the development of sustainability competencies.

OO 3.2 Hasselt University will develop initiatives that contribute to a sustainable mindset among students.

To increase the support for these operational goals by the members of the Educational Board of UHasselt, two aspects were crucial in their implementation: (1) each educational program has the freedom to contextualize the sustainability competencies to their specific needs, and (2) the sustainability competencies would be merged with the existing framework of employability skills to acknowledge the efforts of the past.

Developing a competence framework

Drawing from the scientific literature on sustainability competencies (Wiek et al, 2015; Ploum et al, 2018; Bianchi et al, 2022) and aligning them with the existing employability skills, a comprehensive framework was developed (table 1).

Table 1: Alignment of employability skills and sustainability competencies into the final UHasselt competency framework

Hasselt University competency framework	Employability skills (ESs)	Sustainability competencies
Inclusive collaboration	Communication and presentation Multidisciplinary cooperation Stakeholder awareness	Interpersonal competence Embracing diversity & interdisciplinary competence
Systems thinking	Communication and presentation Multidisciplinary cooperation Stakeholder awareness	System theory
Ethical and sustainable reflection	Communication and presentation Stakeholder awareness Integrity	Normative competency
Sustainable action	Communication and presentation Stakeholder awareness Integrity	Strategic management & Action competency Anticipatory competency

However, ongoing dialogues between the Educational Policy Directorate and the Educational Management Teams in the context of the baseline assessment of sustainability and sustainability competencies revealed faculties' queries regarding definitions, implementation strategies, differentiation between bachelor's versus master's programs, and the need for maturity levels or actions. To address these concerns, an internal expert group was formed to refine the UHasselt competence framework, elucidate coherence between competencies and sustainability themes, and visualize the framework (figure 1), ensuring comprehensive understanding and buy-in.

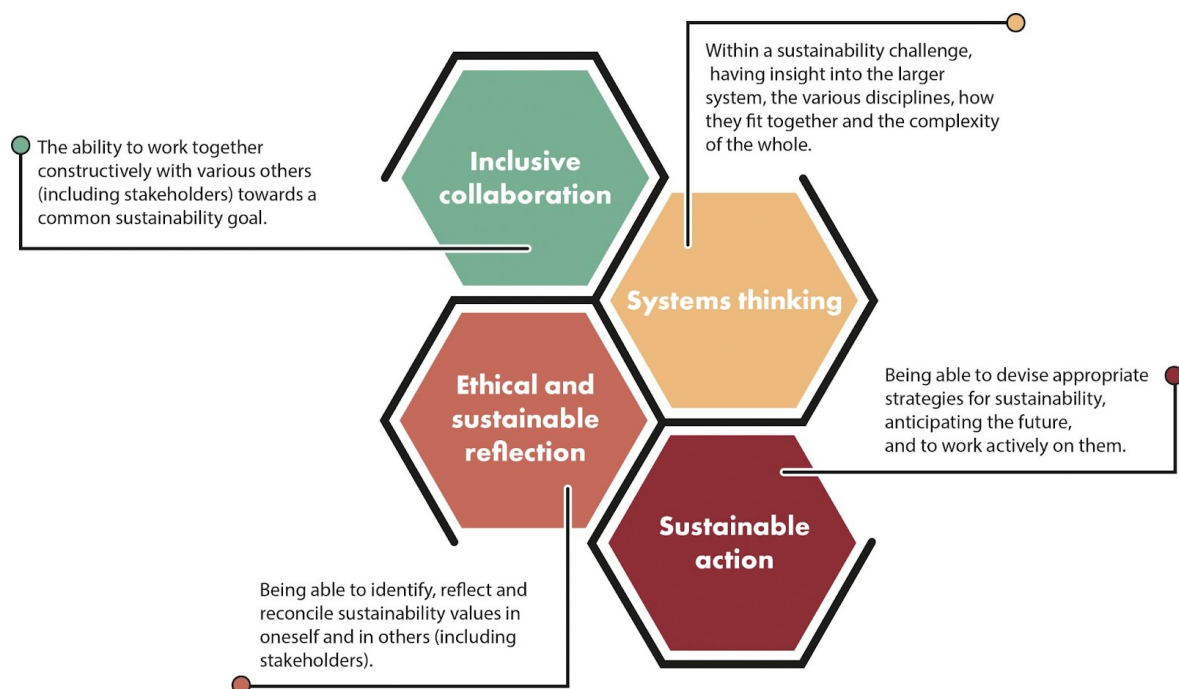


Figure 1: Visualization of the final UHasselt competency framework

Implementation strategies

With the framework finalized, efforts shifted towards implementation. Various supportive measures were introduced:

- Feedback on the baseline assessment to each Educational Management Team with a customized feedforward message on how to proceed with the implementation

- Courses for professionalization of the teaching staff through basic sessions and a learning trajectory ‘Sustainability in your courses’
- Toolbox on the intranet with:
 - General information about the theme of sustainability, sustainability models, sustainability in UHasselt-education
 - Specific information about UHasselt competence framework, examples of partial competencies, working and teaching methods and evaluation
- Tailored information sessions for Educational Management Teams and faculties
- Educational support by the Education Policy and Quality Assurance directorate
- Monitoring progress via periodic dialogues in the context of quality assurance

Challenges and future directions

Despite two years of ongoing implementation, it is clear that there are still challenges, ranging from clarification of concepts to varying paces of integration across faculties and educational programs.

Faculties like the Faculty of Architecture & Arts showcase proactive initiatives while others are at different stages of progress. Also learning as sustainability is included, e.g. by involving students from different faculties in the carbon footprint calculation of the university. More examples of different approaches adopted by different faculties will be shared during the presentation. Anyway, addressing these challenges clearly requires tailored professionalization and program-specific interventions. Future endeavours include developing online learning trajectories, refining partial competencies and evaluation tools, and fostering collaboration to navigate diverse challenges.

Conclusion

The integration of sustainability competencies in the Educational Policy Plan 2022-2029 can be considered a significant milestone in Hasselt University’s journey towards sustainability. While challenges remain, collective efforts underscore a shared commitment to fostering sustainability competencies across educational programs. With ongoing initiatives and collaborative endeavours, UHasselt is ready to realize its vision of sustainable education, steering towards a more equitable and resilient future.

Keywords

curricula; sustainability goals; implementation process; competency framework

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32 | Continuing Professional Development in Healthcare: barrier, enablers, and resources' management

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Abstract

As stated by Gandhi et al. (2020), the healthcare system plays a critical role in fostering sustainability worldwide: indeed, in the UK, the NHS is seen as the largest public sector contributor to carbon emissions, as it accounts for 5% of all traffic on UK roads, 5% of England's carbon footprint, and 4% of the country's solid waste. Even though some medical schools have already embedded the main principles of sustainability in their curricula, their practical application in postgraduate curricula and clinical practice still lacks.

In light of this, by applying the basic principles suggested by the Center for Sustainable Healthcare (Mortimer, 2010) within the four main domains such as prevention, patient empowerment and self-care, streamlining the efficiency of care and clinical pathways, and improving the use of clinical resources, we will definitely make the healthcare system more efficient and sustainable.

From an educational point of view, the adoption of a goal-oriented educational framework where the overall resources are well managed and aligned with the intended outcomes should represent a priority in the «to-do list» of governments and regulatory bodies.

However, we recognize the challenging nature of the educational shift from a time-based framework to a competence-based one, acknowledging this change occurs in different cultural and social contexts, where intrinsic and extrinsic factors may affect the implementation of any innovation we plan to introduce.

Continuing Professional Development (CPD) is recognized by medical educators and policymakers as a cornerstone for enhancing professional expertise and effectively addressing public health needs. Recognizing the critical role of CPD is essential as CPD activities, especially when they are interactive and provided in diverse formats over a long period of time, significantly contribute to enhancing clinical competence among health professionals. This, in turn, enables them to respond more efficiently to the health needs of the population, as noted by Samuel et al. (2021) and Cervero et al. (2015). However, what constitutes good practice in regard to fostering relevant competencies across health professionals remains a debated subject among stakeholders.

Competency-Based Medical Education (CBME) is an outcomes-based approach to the design, implementation, assessment, and evaluation of medical education programs. It involves an organizing framework of competencies suitable for the stage of training for that program's participants (Frank et al., 2010; Weill Cornell Medical College Qatar, 2013). According to the American medical CBME framework, «competent health professionals» are often defined as possessing the six ACGME (Accreditation Council for Graduate Medical Education) milestones of competency: medical knowledge, patient care, practice-based learning and improvement, professionalism, interpersonal and communication skills, and system-based practice. Many institutions and regulatory bodies are endorsing a transition from time-based to competency-based frameworks in medical education. Examples include Canada's CanMEDS and the USA's ACGME. These frameworks emphasize the competencies that need to be acquired and demonstrated throughout a medical career, as discussed by Bandiera et al. (2006) and Green et al. (2009).

Even though the merits of Competency-Based Medical Education (CBME) are well established, its ef-

fective implementation across different clinical and cultural settings is recognized as an ongoing challenge by stakeholders (Caverzagie et al., 2017). Competent health professionals benefit the global population in terms of costs and efficiency of healthcare systems, patient-centered care, professionals' engagement, and growth opportunities (Lloyd, 2014). Given this, it is critical to explore effective implementation across international settings.

Previous reviews have analyzed the evidence of family physicians' competencies according to the Canadian CanMEDS framework (Kitto et al., 2018), finding a significant lack of evidence-based literature relating to CBME implementation in CPD contexts. A further challenge to the implementation of CBME within CPD settings is the diversity of professional profiles and clinical environments globally. Standardizing professional competencies becomes difficult where there are only limited similarities across various cultural and professional settings (Janssen et al., 2023). As with any other structural change within medical education, shifting toward a new curriculum design requires a deep analysis of factors influencing curriculum adoption and engagement – in other words, the barriers and enablers to achieving the intended outcome of curriculum redesign (Stoffman, 2022). There is a gap in understanding barriers and enablers related to the implementation of CBME within the specific context of CPD curricula globally. CPD is a unique setting that is likely to yield different facilitators and barriers for those implementing CBME. Creating a robust, evidence-based foundation for the competency-based CPD curriculum would support its global implementation across medical institutions, leveraging its proven validity and reliability.

In this study, we seek to gain a clearer understanding of the key barriers and facilitators that significantly influence this process. To do so, we need to map current approaches to implementation within CPD curricula, exploring this literature for insights on barriers to adopting a competency-based approach. Indeed, literature on implementation within CPD settings is disparate and in need of synthesis.

Given this, a scoping review is necessary, through which we can explore key literature on this topic. Simultaneously, we aim to identify the relevant enablers facilitating this educational shift, to leverage them within the recommendations for practice generated at the end of this review.

Finally, we argue that it is in our hands as medical educators to train forward-thinking healthcare staff who consider sustainability a milestone throughout every phase of their professional growth, rather than a mere tick box exercise in their educational portfolio.

Keywords

CPD in healthcare; goal-oriented medical curricula; optimizing resources; barriers and enablers

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33 | Enabling transformative agency in teacher education for sustainable inclusive practices

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Abstract

The term «agency» is often cited within an array of fields of research to describe phenomena under study. Owing to the intricate nature of the actors and systems involved, firstly, we aim to capture the fundamental essence of agency as interpreted in various scholarly contributions. We then endeavour to articulate a definition of transformative competence inherent in teacher agency with the objective of bringing to light further reflection on the effectiveness, in terms of sustainability, of teacher education course programmes to foster inclusive learning environments over time.

Agency embodies the capacity to act consciously and responsibly, guiding one's choices autonomously (Bandura, 1989; Biesta & Tedder, 2007) in order to respond appropriately and effectively to the needs that arise in a given situation, in familiar or unfamiliar contexts. Authors such as Lipponen and Kummulainen (2011) have emphasised the transformative instances in terms of the development of the individuals' skill set, attitudes and competence acquisition through the agents' ability to find and implement alternative solutions to the needs and necessities that arise in more or less expected ways in daily interactions. Transformative agency can thus be considered as the ability to deal with complex situations by resorting to non-linear, unhabitual, and non-conventional solutions when needed rather than relying on generally recognised, attributed, and tried-and-tested interactions.

In more recent years, the concept of agency has become pivotal in teacher education identified as the catalyst to bring about change and foster the creation of inclusive and sustainable learning environments (Sibilio & Aiello, 2018). Reflection in and on action (Schön, 1993), has become the means to critically and conscientiously consider the interactions between the actors involved and the environment (Mezirow, 2003) as well as concentrate one's attention on the affordances readily available conducive to school performance (Aiello, Sharma, & Sibilio, 2016). These assumptions bring to the fore the need to rethink teacher education course programming apt to respond to the complexity and heterogeneity of learning environments, particularly within school institutions (Taylor, 2000). Indeed, it has been noted that the confidence of future teachers in training regarding the feasibility of the implementation of inclusive processes diminishes as their teaching experience in school contexts increases (Costello & Boyle, 2013; Sari et al., 2009). Due to the wicked nature (Armstrong, 2017) of 21st Century inclusive classrooms, it is true that there can be no right or wrong solution, but good ways to deal with this complexity can and need to be found.

Our proposal adopts a bio-educational approach (Frauenfelder et al, 2013), focussing on the concept of «Umwelt» initially proposed by ethologist von Uexküll (Von Uexkull, 2017), and further developed by physiologist Alain Berthoz (2009). Von Uexküll's (2017) perspective underscores that the term Umwelt signifies more than a mere container of events; it represents a dynamic system of signs and meanings, inviting organisms to action. In this dynamic environment, each organism contributes to possible transformations, highlighting the plurality of interactions within it. Thus, the term environment embodies a complex reality in continual flux, wherein individuals continuously adapt, acquiring skills to effectively navigate diverse situations.

The ability of living organisms to navigate within complex ecosystems, adapting to find novel solutions for survival or problem-solving, presupposes a readiness to adjust actions and perceptions in response to contextual dimensions (Berthoz, 2009). Consequently, it cultivates a natural propensity for trans-

forming actions, perceptions, and one's environment. In his theory of simplicity, Berthoz identifies a set of "biological devices, or processes [that] appeared in the course of evolution to allow animals and people to survive on our planet [by] processing complex situations very rapidly, elegantly and efficiently, taking past experience into account and anticipating the future" (Berthoz, 2012, p. 3). This innate ensemble of capabilities, defined as principles and properties, when utilised effectively, can guide teachers to face the complexity of inclusive educational contexts. In turn, an inclusive educator, cognisant of one's own resources and the learners' potential, discerns opportunities for intervention and interaction with and among students (Aiello, Pace, & Sibilio, 2021), fostering a democratic learning environment, sensitive to diversity and responsive to all needs.

Keywords

teacher education; inclusion; sustainability; agency; simplicity

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35 | School: 'spy plant' like the rose for the rows of vines. The necessity of Education for sustainability

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Abstract

The Latin etymology of the word sustainability, from the verb *sustineo*, *-ere*, means to resist, to endure, and at the same time to support, sustain, protect and nourish. A lexical similarity between sustainability and education can be established from the latter two meanings, since education, according to Freire, should protect and nourish vulnerable children and adolescents (Freire, 1970). There is an ancestral link to sustainable education that is rooted in the origins of our country and our language. This link has led us, as adults and teachers, to try to understand what a child or an adolescent can perceive as sustainable or unsustainable in his/her school time and spaces.

In the opening pages of the Whole School Approach (WSA) report to Sustainable Development we can read: «By interrogating, rethinking, and redesigning institutional practices the 'hidden curriculum of unsustainability' that is often present, can also be exposed and addressed» (Mathie & Wals, 2022, p.7). The above report highlights a shortcoming: the failure of the 'Belpaese' to translate this broader approach into concrete action. It is from this call for educational responsibility (Chen & Liu, 2020; Torsdottir et al., 2024) that a research study focusing on "The well-being of adolescents in the classroom" has taken its first steps in recent years.

So, the question we raise is: can we think and discuss about sustainability pedagogy and education in our classrooms? Is the school a supporting, protecting, nourishing environment? Following the critical-emancipatory paradigm (Lincoln & Denzin, 2023), the aim of our research was to bring to light the current conditions of malaise and unease – the 'hidden curriculum of unsustainability' – that are virulently affecting our young people. This deadly symptomatology propagated by the parasitic logic of neoliberalism (McLaren, 2015), has resulted in a hidden capacity for desire.

During the school year 2022/2023, a qualitative-quantitative survey was carried out in several secondary schools in the Padua and Treviso area. Through an operation of *questioning* (in a participatory and non-evaluative sense) of the students who inhabit the school daily, this research generated a desire for *alethèia*, to open up a movement of reflection and action due to the theory of praxis (Gramsci, 2014). A total of 157 students aged from 14 to 19 participated in the observational study. Using a semi-structured questionnaire consisting of 5 questions (2 closed-ended or Likert scale and 3 open-ended), preceded by a brief biographical analysis, we investigated the level of wellness/illness that the students reported experiencing in their class and the impact that the experience of illness had on school performance and learning ability. The questionnaire was administered using the Google Forms tool and the administrations took place within the classes involved.

The data reveal a widespread sense of vulnerability: 64.3% of the participants report being in a fragile state (diagnosed and/or perceived), with conditions such as anxiety, sadness and depression being common. The most reported forms of distress were psychological and mental distress, as well as the presence of Specific Learning Disorder (SLD) and exposure to violence, confirming previous research studies (WHO, 2021; Meherali et al., 2021; Pedrini et al., 2022).

We have devoted part of our analysis to understanding how much and how the students perceived the illness as being able to condition those activities that were properly didactic (studying at home, maintaining concentration during lessons, oral exams, etc.) and those that were not (travelling to school, experiencing substitute teaching, recess, etc.). In this context, we asked them to rate, on a scale of 1 to 10, the extent to which their state of health affects their performance at school, and the data show a

moderate impact of experienced fragility on the school experience (5.4), with slightly higher values for girls than for their male counterparts. Relating this figure to the answers given later, we can trace it back to an apparent ability to manage one's emotional states, dictated by an illusory control and a desire to keep personal life and school separate.

Another interesting element for our analysis is that of the educational activities that are considered to be more strenuous and to be an obstacle to one's serenity and well-being in the school environment. These can be a valid starting point for reflection on the design of our curricula. On the podium, we encounter challenges such as fatigue during oral examinations, maintaining concentration during teachers' lectures, and individual study at home. These activities require individuals to take responsibility for their own emotions and internal states, which require self-regulation and management. Individuals who have reported living with a SLD report greater difficulty in maintaining concentration in class, as well as fatigue when taking written and oral tests. Similarly, students who have experienced psychological and/or mental or violence also report finding oral tests more challenging. In terms of qualitative analysis, the participant reported experiencing a state of almost chronic fatigue. This fatigue is linked to the demands of teaching activities, individual study, and maintaining concentration during the lessons. Anxiety is a common experience in everyday life, but it is rarely seen in a positive light: when it can improve performance.

In conclusion, education for sustainability should become a necessity: not just the transmission of a set of sustainability skills, but a sustainable accompaniment to the exercise of responsible humanity. This is why it is important to involve the whole of society in a «*holistic, systemic, co-creative and reflexive*» (Mathie & Wals, 2022, p.5), critical and democratic way (Torsdottir et al., 2024). Just as the rose acts as a “spy plant” for the rows of vines, so the school can be a sentinel: at the moment when the first the forms of discomfort and malaise bloom, we are all called to assume an ethical responsibility towards youths, in order to make the school a “*living laboratory for experimenting with healthy, equitable, democratic, and ecologically sustainable living*” (Mathie & Wals, 2022, p.3). If schools must promote *sustainable living*, they must make education sustainable by healing and nurturing youth through a critical approach that enables them to understand their rights and duties as humans.

Keywords

Education for Sustainability; Well-being; School performance; Secondary school; Democracy.

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36 | Educational Technology under scrutiny in higher education: balancing economic, environmental and social factors

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Abstract

Introduction

In 1987, the World Commission on Environment and Development (WCED) stated that environmental problems are linked to economic, social and political factors. Balancing these factors was a premise for the subsequent United Nations processes culminating in the Sustainable Development Goals.

We adopt the same premise for sustainability to study the affordances and drawbacks of educational technology (EdTech) in higher education (HE). With EdTech's growing influence on educational design, following COVID-19, it is essential to create awareness of its role and impact on the sustainability transition in HE. EdTech is produced by privately owned for-profit companies involved in the financing, producing and distributing commercial hardware, software, cultural goods, services and platforms for the educational market including HE institutions. The implications for a sustainable society of an academic environment infused with digital technology, data analytics and artificial intelligence are unclear. HE must find a balance in how to provide sustainability-oriented education using digital technology.

EdTech and economic interests

The EdTech marketing strategy is based on the certainty that technology will be needed in future for environmentally sustainable forms of education. EdTech entrepreneurs promise a 'technological fix' to societal problems facing HE, such as the accessibility of education or budget cuts. Their strategy of making alliances, problem-solving promises, predictions of needing educational technology and the 'emergency remote teaching' experiences during COVID-19 have resulted in exponential growth of the investments in privately owned EdTech companies (not listed on a share market).

The platform model seems to have the greatest potential to increase profits for EdTech companies. These platforms, also called learning management systems (LMSs), need regular upgrading with new features, can be integrated with other platform services and continuously extract digital data, creating a reliable revenue stream for investors. Digital data gain value through processes like extracting meaningful information, enclosing it, storing, aggregating, analysing, and transforming it into intelligence deployed in areas including Learning Analytics (LA) and Artificial Intelligence for Education (AIED). This encompasses various sources, ranging from scholarly discussions in virtual learning environments to user behaviour data, including click-throughs on platforms and metadata detailing users' devices, locations, and internet protocol addresses. AI-based methods analyse the pattern of collected student platform data for developing the algorithms that can support the individual learner. These patterns may contain race, gender or other biases. In addition, the constant monitoring of students' digital behaviour on the platform increases surveillance and can amplify feelings of stress and anxiety around their loss of autonomy. In addition, transparency about data ownership and what it is used for is ill-regulated and there are ethical concerns about privacy and intellectual property rights. A human-centred approach in HE's policy is essential when using EdTech.

EdTech and environmental dilemmas

EdTech creates opportunities for place-independent education delivery or conference presentations, probably decreasing commute-related travel, international business travel, and electricity purchased for campus facilities. The amount of student travel emissions in HE depends on how often students commute to attend classes on campus, the campus location and which travel mode they choose. The impact ranges between approximately 20 to 90 per cent of the overall carbon footprint. HE's measures to influence student travel behaviour are mostly directed at changing students' travel modes from carbon-intensive to low-carbon modes. Still, they ignore the potential of digital technologies to enable location-independent learning for a few days per week.

The main contribution of academic staff to the carbon footprint is their visits to international conferences, often by plane, which account for about 3 to 55 per cent of a HEI's footprint. Digital technologies can play a role in mitigating these emissions by supporting the organisation of hybrid meetings whether or not in two different venues.

It is still an ongoing discussion if the reduction of travel emissions of students and staff outweighs the emissions due to EdTech's energy consumption. HE is likely to expand the use of AIED and LA. Creating AI models for AIED necessitates training deep learning systems on massive datasets, which demands substantial energy for both training and validation processes, resulting in considerable carbon emissions. Additionally, these datasets are stored on data centre servers, requiring significant energy for data storage and responding to data requests.

Another issue to address concerning EdTech is electronic waste disposal's health and environmental risks.

EdTech and educational quality

EdTech may be used to lower HE's carbon footprint if learning activities are scheduled with a clear division between on-campus and online learning days, so-called blended learning, reducing students' commute to attend on-campus classes. Blended learning should not compromise or better still, enhance educational quality.

Transformation to a sustainable world needs 'change agents', who know what they can and want to change and how to take action for implementation. This requires a pedagogical approach that supports students in developing sustainability competencies, providing the students with the necessary knowledge and skills to analyse systems across different domains, anticipate future challenges, apply ethical values, design, and implement transformative interventions engaging stakeholders in the process.

The pedagogical design principles for sustainability-oriented blended learning of Versteijlen and Wals (2023) can be used to guide the design and assess the pedagogical quality of a learning unit. These design principles relate to self-regulation and self-awareness, a safe and social learning environment, interaction and discussion, transformative learning acquisition, authentic and action-oriented practice and transdisciplinary collaboration. EdTech can support this design in many ways by combining virtual and physical spaces in such a way that the strengths of both are exploited and complement each other.

Proposed framework

The key concepts of EdTech under scrutiny are depicted in a Framework for Sustainable EdTech Application in HE. In this framework, the educational system is represented by the relationship between EdTech companies, HE, and their governance and policies. HE plays a crucial role in the sustainability challenges facing the world. This responsibility requires HE to embed sustainability in all aspects of its policies, a so-called 'whole-institution approach'. Adding EdTech to these aspects, this approach ensures sustainability-oriented (blended) education and research, organised in such a way that the deployment of EdTech is human-centred and environmentally aware.

Keywords

EdTech; blended learning; carbon emissions; student and staff travel

38 | Are you ready to change the world for the better? International comparative study on university students' sustainable development competencies

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Abstract

Collaborating with international partners in the education for sustainable development (ESD) field is paramount. The topicality of the problem arises from the need to justify the analysis of good practices in education for sustainable development in the context of young people's readiness to use knowledge and skills related to sustainable development issues in their private and professional lives. This is important due to the desire to improve the competencies of specialists in each field in various aspects of sustainable development, where globalization and the concept of world citizenship go beyond the aspects of formal knowledge and skills, also covering emotional and ideological spheres.

This paper presents preliminary study results regarding university students' Sustainable Development (SD) competencies. These results are part of the wider international project for teacher training students. The purpose of the presented results is to compare students' competencies toward SD issues from the perspective of five countries (Poland, Germany, Japan, Bulgaria, and Spain). Therefore, the study addressed the following research questions:

Q1: What are the university students' SD competencies in the categories of knowledge, key competencies and SD behavior differed in every country?

Q2: To what extent are the categories of competencies for sustainable development analyzed among students from different countries related to each other?

Q3: To what extent is the SD content introduced in educational programs related to the SD competencies of university students originating from the compared countries?

The study was conducted at institutions in five countries during the academic year 2023-2024. There were 410 respondents-university students (165 students were from Poland, 79 - were from Germany, 84 - were from Japan, 43 - were from Bulgaria, and 39 - were from Spain). The study follows the design of a survey based on the Theory of Action. The study tool was based on a self-evaluation approach. It consisted of items that can be assigned to four categories: the SD knowledge in chosen sustainable development areas (biodiversity, climate change, sustainable production and consumption, reduction of poverty and sustainable development goals), key competencies (cross-disciplinary, multifunctional and context-independent), the sustainable behavior (activities in everyday life related to compliance with the principles of sustainable development), and integration of the sustainable development goals (SDGs) into university educational programs (contents related to responsible consumption and production, life below water, climate action, reducing poverty, life on land).

The findings of the study revealed that nationality significantly varied in all studied categories. Students from Japan showed the highest results in all three analyzed categories regarding SD competencies. However, the lowest results were diagnosed among students from Bulgaria and Spain. There are significant, positive correlations between all ESD categories, ranging in strength from small (between Integration of the SDGs into university educational programs and SD Knowledge, Key competencies, and Sustainable Behavior) to average (between Sustainable Behavior and SD Knowledge and between Sustainable Behavior and Key Competencies) to strong (between Key Competencies and SD Knowledge).

Finally, significant relations of SD content introduced in educational programs with SD competencies were observed among Japanese, Polish, and Spanish students. Revealed correlations were positive with a medium power. As SD integration content in educational program ratings increased, the level of SD competencies improved among respondents from the indicated countries.

It seems that the discovered differences in SD competencies can be at least partially explained by the cultural differences of respondents from the analyzed countries. However, the results obtained should be treated with caution. The conducted research has limitations specific to cross-sectional quantitative research. It cannot be ruled out that respondents were not sufficiently motivated to give comprehensive answers, or there was a tendency for them to choose answers in line with political correctness. Another shortcoming is related to the unequal numbers of representatives from the countries that were analyzed, which may have affected the reliability of statistical estimates. Finally, the study conducted was cross-sectional, although the relationships analyzed assume the processual nature of the acquisition of various content, including SD-related content. Accordingly, studies implemented in a longitudinal scheme would be more appropriate.

Keywords

SD competencies, sustainable behavior, SD knowledge, key competencies, self-evaluation, university students, international study

39 | Education for Sustainable Development: A Case Study of Mount Kenya University's Competency Based Curriculum (Cbc) in Improving Higher Education in Kenyan

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Abstract

Kenya has been having the 8-4-4 system of Education which has recently been replaced by the Competency Based Curriculum

Communication is the process of transferring information from a sender to a recipient, whether verbally or non-verbally. Collaboration is the process of two or more people working together to realize shared goals. Collaborative learning is designed to help learners learn from each other. II. Critical thinking refers to ability to come up with solutions for problems or issues faced in real life situations. This is done by defining the problem, gathering information, sorting, organizing, classifying and analysing materials and data. Problem-solving is the ability to identify and problems, cope with complexities, reason, argue and make sound decisions.III. Imagination is the ability to form mental picture of something that one has not seen or experienced while creativity is the ability to come up with new ways of solving problems. IV. Citizenship is the state of being vested with the rights, privileges, and duties of a citizen. It also implies being a member of a country and behaving in a manner that is expected of you by people living in the same country.V. Digital literacy can be described as having the knowledge, skills and behaviours which are necessary to effectively and safely use a wide range of digital content and devices. Such devices include mobile phones, smart phones, tablets, laptops and desktops among others.VI. Learning to Learn Is the ability to pursue and persist in learning, to organise one's own learning by the effective management of time and information, both individually and in groups. VII. Self-efficacy is a person's belief about his or her capabilities to perform tasks or assignments that can change and transform life.Others areas of interest include:i.Global Citizenship,Peace education, integrity, ethnic and racial relations, social cohesion, patriotism and good governance , human rights and responsibilities, child's rights, child care and protection, gender issues in education.ii.Health Education HIV and AIDS Education, alcohol and drug abuse prevention, life style diseases, and personal hygiene, and preventive ealth, common communicable and chronic diseases iii.Life Skills and Values EducationLife skills, values, moral education and human sexuality, etiquette.iv.Education for Sustainable Development (ECD)Environmental education, disaster risk reduction, safety and security education ,financial literacy, poverty eradication, countering terrorism, extreme violence and radicalization, gender issues and animal welfare.v.Learner support programmes-Guidance services, career guidance, counselling services, peer education, mentorship, learning to live together, clubs and societies, sports and games.vi.Community Service Learning and Parental EngagementService learning and community involvement, parental empowerment and engagement.

Understanding the New Education System in Kenya: The CBC Education System:The Competency-Based Curriculum (CBC) in Kenya follows a 2-6-3-3-3 education cycle, which means learners transition through a total of 17 levels, with each level lasting for one year. The curriculum is divided into four main categories:a. Early Year Education (EYE): This category focuses on mastering basic skills and consists of two sub-categories:i. Pre-Primary: Comprising of Pre-Primary 1 (PP1) and Pre-Primary 2 (PP2), which were formerly referred to as Nursery. Children enter this level at a minimum age of 4 years old. Before Pre-Primary, there is also the option of Day-Care, which takes one year but is not mandatory.ii. Lower Primary: After Pre-Primary, learners move on to Grade 1, Grade 2, and Grade 3. At the end of Grade 3, the Kenya National Examination Council (KNEC) assesses students to determine if they are ready to progress to the Middle School level.b. Middle School: This category includes Upper Primary and Lower Secondary levels.i. Upper Primary: Consisting of Grade 4, Grade 5, and Grade 6, learners are assessed by KNEC at the end of Grade 6 to determine their readiness for Lower Secondary.ii. Lower Secondary:

Comprising of Grade 7, Grade 8, and Grade 9, learners undergo another KNEC assessment at the end of Grade 9 to determine their readiness for Senior School. c. Senior School: At this stage, learners start to specialize in their chosen career paths. The time spent here allows them to explore their interests and capabilities. i. Grade 10, Grade 11, and Grade 12: Learners will select their career path, choosing from categories such as Arts & Sports Sciences, Social Sciences, or STEM (Science, Technology, Engineering, and Mathematics). After completing Grade 12, students have the option to attend Technical and Vocational Educational and Training (TVET) institutions, universities, or pursue entrepreneurial ventures. Tertiary Education (TVET or University): Tertiary education and training typically take a minimum of 3 years, with some career paths requiring longer durations. Learning Areas, Strands, and Sub-Strands.

Benefits of the CBC: The Competency-Based Curriculum offers several benefits for learners:

a. Holistic Development: By emphasizing practical skills and competencies, the CBC promotes a more well-rounded and holistic development of learners. b. Flexible Career Choices: The Senior School level allows learners to explore different career paths, enabling them to make informed choices based on their interests and aptitudes. c. Reduced Focus on Exams: The CBC reduces the reliance on high-stakes exams and focuses more on continuous assessment, reducing exam-related stress for learners. d. Real-world Relevance: With a focus on practical skills and competencies, learners are equipped for real-world challenges. e. Individualized learning. The CBC recognizes that students have unique learning styles and paces.

The competency-based curriculum design proposed by is based on three Theories: socio - constructivist theories of knowledge; curricular theories centered on learning outcomes and, curricular theories centered on standards.

Conclusion

The Competency-Based Curriculum (CBC) in Kenya is designed to provide a more holistic, relevant, and personalized learning experience for learners. The curriculum's structure allows learners to develop practical skills, critical thinking and explore their interests, and make informed career choices. By shifting the focus from traditional exams to continuous assessments, the CBC aims to prepare learners for the challenges of the real world. supporting your child's learning journey through the CBC, fostering their growth and preparing them for a successful Mount Kenya University students on Teaching practice Together, embrace this exciting new chapter in education!

Keywords

Competency, sustainable development, education

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41 | Learning by Doing Sustainability Projects with Cooperating Partner Organizations in Real-Life Settings

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Abstract

Learning by Doing Sustainability Projects with Cooperating Partner Organizations in Real-Life Settings

The concept of sustainable development has been developed more concretely by the UN in the form of 17 Sustainable Development Goals (SDGs). The fourth goal, “Quality education”, contains the sub-goal 4.7: “By 2030, ensure that all learners acquire the knowledge and skills needed for sustainable development, including through education for sustainable development”. This gives universities a central role in enabling the SDGs, as education for sustainable development (ESD) is not only a goal, but also a means by which the other SDGs are to be achieved.

This paper presents initial results from the University of Erfurt’s “Education for Sustainable Development” (ESD) sub-project of the KLIMA-Network for Thuringia. The KLIMA-Network is a cooperation of four universities in the state of Thuringia (Germany), funded by the federal ministry for science and education, running from 11/2022 until 10/2025. In the sub-project on Education for Sustainable Development (ESD), the University of Erfurt is analysing exemplary transformative teaching-learning arrangements based on the concept of service learning and evaluating their transformative effectiveness. The effectiveness analysis follows a formative evaluation logic, i.e. the evaluation is to be carried out together with the participants and used directly to improve ESD and the general sustainability concept. The aim is to implement transformative ESD throughout the entire KLIMA-Network. Conceptual considerations from pragmatist educational theory, especially from John Dewey, are juxtaposed with empirical results from surveys of students, cooperating partners and teachers in order to develop conditions for a successful ESD.

The focus of this paper will be the relationship to cooperating partner organizations providing real-life settings for projects the students realize in service learning seminars. These cooperating partners can be companies, administrations, schools, non-profit-organizations etc. Two types of seminars will be analysed: First, BA-Seminars on sustainability using service learning as teaching concept, and second, MA-Capstone-Seminars in the programme Master of Public Policy. In both cases the students conduct projects with cooperating partners working on real-life problems in groups.

Cooperating partners, as committed experts in specific subject areas, appear here as mediator between the action programme, the challenge of implementing sustainability locally and the university. They are the ones who can open up spaces for students to experience sustainable development, in which they can deal with concrete challenges of sustainability and social coexistence. Students can act as committed and competent shapers of social change (change agents). With their access to the local requirements of a sustainable community, cooperating partners are competent contributors for a co-operation that should be valued and consolidated as a contribution to the link between educational institutions and the community.

The following conditions for success, which were developed as part of the project, will be analysed empirically by a survey and in-depth interviews in order to define conditions for successful cooperation with partners from outside of the university:

1) Conditions for success with regard to the organisational constitution:

- Internal communication: Sustainable development and the implementation of related projects should be the subject of internal communication, so that the members of the organisation are

informed about current implementations and sustainability is established as an important topic of internal communication.

- Value orientation: The cooperating partner represents the values of sustainable development both publicly and at organisational level and acts on this basis in a value-led manner. The United Nations Sustainable Development Goals (SDGs), the German Sustainability Strategy, the Thuringian Sustainability Strategy and related concepts form the frame of reference for this value orientation.
- Employees: The cooperating partner can provide competent staff as contact persons for the target group-oriented realisation and implementation of practical projects with students on sustainability topics. (Permanent) contact persons are available for the participants during the project realisation who accompany and support them in the implementation.
- Continuity: The cooperating partner supports publicising the implementation of sustainable development projects (e.g. at project fairs). In doing so, the relationship of the activities to the intended frame of reference (e.g. sustainability strategy) is made clear.
- Consistency: The design and implementation of projects is generally orientated towards sustainable development standards (e.g. inclusion, resource conservation, climate neutrality). This means that project implementation not only pursues a specific objective of a sustainable project, but also aligns the entire design, approach and realisation with this guiding principle.

2) Conditions for success with regard to joint learning with students (= participants)

- Appropriate objective: Based on the practical relevance, the cooperating partner can formulate a concrete objective for student micro-projects on sustainable development and incorporate it into the design of the projects. This objective can be successfully realised, also in view of the time and personnel resources available.
- Participant-orientation: The requirements of the task to be completed are appropriate to the participants. It takes into account the participants' level of knowledge and, at best, builds on their experience. This should ensure that the participants can work on the task independently and in a goal-orientated manner.
- Diversity of perspectives: Participants are supported by the cooperating partner in an unbiased and experimental manner that encourages the participation of all. A key element of ESD is a joint discussion on how to achieve goals, also based on the participants' different approaches and solutions. On the one hand, this offers the opportunity to weigh up different options for action against each other or, on the other hand, to involve all participants in the joint realisation process in a motivating way.
- Competence orientation: The active involvement of the participants in the design of the project and the personal responsibility for its implementation promote the acquisition of competences. These competences can be taken into account as a learning objective within the framework of the project.
- Participant involvement: The participants are actively involved in the public relations work for the respective project. They report, if necessary under supervision, on the implementation of the project, their involvement in its realisation and/or the experience they have gained.
- Self-evaluation: In the course of the project, there are sufficient opportunities to reflect on the individual planning and implementation steps with a view to practice. The cooperating partner offers sufficient guidance and support for a critical discussion and targeted integration of joint reflection.

Keywords

higher education; service learning, cooperating partner organizations, real-life setting

42 | Teaching Sustainability to Marketing Students in an Implicit and Efficient Way

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Abstract

Undoubtedly, our role as lecturers is to prepare students for the future. Due to the current climate trends and the circumstances that the global community is experiencing (1)(2), lecturers in all disciplines need to address sustainability to enable members of the next workforce to develop the knowledge, skills, and attitudes that will lead to a liveable future.

Ideally, sustainability is taught as an intensive programme to all first-year Higher Education (HE) students as part of a general education curriculum, with the aim of developing the necessary competencies such as system thinking (3)(4)(5). However, due to organisational constraints, many students will not have the opportunity to experience this deep dive into sustainability at the beginning of their studies, particularly if they have chosen to study towards a General Management or Marketing degree. Business programmes unfortunately still have a less clear focus on integrating sustainability topics into their curriculum than, e.g. engineering or political science programmes.

This conceptual study presents a summary of low-touch teaching methods that marketing lecturers can use to efficiently integrate sustainability topics into their modules. It also includes an initial assessment of students' perceptions and reflections on different learning opportunities.

The 8 public universities of applied sciences and arts in Switzerland are closely linked to the economy, culture, and society, with their HE concept focusing on providing highly practice-relevant degrees. At the University of Applied Sciences Northwestern Switzerland (FHNW), lecturers are therefore experimenting with providing students with concrete and applicable skills for future jobs in a sustainable world in addition to the teaching of theoretical knowledge.

As in 2020 students' mobility and international experience due to the Corona restrictions were limited, the coordinator of the module *International Marketing* of the School of Business at the FHNW explored a virtual exchange (Collaborative Online International Learning (COIL)) with Californian students. Students greatly appreciated this learning opportunity, which implicitly addressed sustainability by allowing students to explore international and cultural exchanges without travel (6)(7).

Marketing does not have the reputation for positively contributing to the fight against climate change because of its misunderstood focus on allegedly encouraging consumption of goods and services. In short, the core philosophy of marketing, is about customer-centric management and the development of innovative value propositions, which should create value for the society as a whole (8). Marketing professionals can therefore contribute as part of an interdisciplinary team to leading organisations towards a positive future and research underlines that marketing education needs to incorporate sustainable development (9).

In 2023, the lecturers of the marketing modules decided to provide students more systematically with opportunities to experience and reflect on sustainability topics, in order to shape their understanding of how business leaders can contribute to the fight against climate change. As the FHNW prefers to teach "marketing in a sustainable world" (which means not changing existing marketing theories, however applying them to the new reality, and focussing on the context) rather than "sustainable marketing" (which would explicitly focus on new marketing theories), the lecturers involved explored innovative low-touch learning approaches with a focus more on the context than content. They also had observed in their educational dialogue that business students had become significantly more interested in and

concerned about sustainability over the past years and had been active in developing sustainable ideas in class tasks.

In summary, current marketing students will experience the following learning opportunities in their final two marketing modules on *International Marketing* and *Marketing & Innovation*:

- COIL: Students will experience cultural differences without travelling and will learn about international marketing effectively.
- Ideation with the UN SDG: Students will experience the UN Sustainability Development goals (SDG) as a way to develop an innovation value proposition (10); during the semester, students have to describe a new market offer while addressing at least one SDG in the ideation phase and while considering sustainability marketing aspects.
- Class discussion on selected sustainability topics in marketing: Students will learn about sustainable packaging and circular economy and critically evaluate credible sources for sustainability reporting, allowing them to identify “green washing”.
- Field trip to a major cement producer (Holcim Switzerland): Student will experience world-leading sustainability technology in their production and reflect on how companies in one of the “dirtiest» industries can be at the forefront of sustainable development.

As part of the quality assessment at the FHNW, students will evaluate these sustainability learning opportunities in spring semester. Additionally, the module coordinator will interview selected students to better understand their perceptions and reflections on these methods.

In the presentation at the 2024 Higher Education Summit, we will present an overview of this teaching approach and how the idea, to increase marketing students’ knowledge and motivation on sustainability, was perceived by students.

Keywords

experiential learning; sustainable products; business education.

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47 | Leveraging Public Procurement Practices for University ESG Frameworks: A Legal Perspective with Implications for Private Procurement

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Abstract

This presentation explores the potential for universities, as key institutions in Education for Sustainability (EfS), to leverage procurement practices informed by sustainability clauses. Drawing on a legal perspective inspired by a forthcoming publication, the analysis starts with an exam of how international conventions, constitutions, European Union (EU) regulations and directives and national laws have shaped the actual framework related to procurement agreements and practices in our continent. We shall start by focusing on the public side of the phenomenon for then extending our analysis to the impact on private procurement practices implemented by different type of undertakings, across a few jurisdictions.

Italy serves as a prime example. Its recent public procurement reform (New Public Procurement Code – *Nuovo Codice degli Appalti*) lacks an explicit mention of Environmental Social and Governance (ESG) principles in its formulation, although these principles are enshrined in the Italian Constitution and other applicable provisions, including, but not limited to, European directives on public procurement incorporated into Italian legal order. This somehow contrasts with France and Spain, for example, where equivalent provisions constituting their public procurement frameworks explicitly mentioned ESG Principles and the relative obligations to comply with them. This comparative approach highlights the influence of legal frameworks on public procurement and its cascading effect on both public and private entities.

Public procurement practices can influence private procurement in two primary ways. First, international conventions, constitutions, and EU provisions establish core principles that may be directly enforceable against private undertakings. These principles, while directly governing public procurement, permeate also the private sector through various avenues. This includes EU sources, national constitutions, and broader regulatory frameworks. For instance, constitutional guarantees of environmental protection might translate into regulations mandating environmental assessments for certain projects undertaken by both public and private actors as well as broader compliance obligations and related liability. On the other hand, ESG disclosure requirements for large undertakings contained in the EU Directive on Sustainability Reporting as well as the recent Corporate Sustainability Due Diligence Directive (May 2024) incentivize also public entities to adopt sustainable practices, governance structures and processes. Second, “soft law”, comprising market forces and non-binding standards set by influential organizations, shapes practices across sectors. Universities, as major players in the education sector, are particularly susceptible to these influences.

While acknowledging the inherent differences between public and private procurement, the presentation argues that studying sector practices informed by «sustainability clauses» offers valuable insights. By benchmarking these practices, universities can develop ESG frameworks tailored to their specific context. This fosters a shared ethos of environmental and social responsibility within the university community. Drawing upon the Whole-Institution Approach’s (WIA) “vision, ethos, leadership, and coordination” dimension, the presentation highlights how benchmarking procurement practices informs a university’s approach to EfS. By understanding the legal and “soft law” influences on public procurement, universities can develop a clearer vision for integrating sustainability principles into their pro-

cesses. This, in turn, fosters a shared ethos of environmental and social responsibility within the university community and society at large.

The presentation expands its scope to explore connections with other dimensions of the WIA framework, in addition to Institutional Practices.

Capacity Building: Universities play a crucial role in fostering sustainability knowledge and action across their entire community. The presentation will examine how universities can leverage procurement practices informed by sustainability clauses to promote continuous professional development for staff. This can involve creating opportunities for staff to discuss, learn about, and reflect on sustainability issues. Equipping staff with this knowledge empowers them to make informed decisions and integrate sustainability principles into their daily work.

Community Connections: Universities are integral parts of their social and cultural fabric. The presentation will explore how universities can utilize learnings from procurement's focus on community engagement to strengthen their own connections with the wider community. This can involve fostering partnerships with public entities, local businesses, Non-Governmental Organisations (NGOs), and other associations. Universities is already offering their expertise and resources to the community while learning from local knowledge and perspectives, few new avenues in this sense can be explored. Such collaborations can create a "living laboratory" for authentic learning and problem-solving around sustainability challenges.

The presentation concludes by emphasizing the importance of collaboration and leadership in implementing effective ESG frameworks within universities. The legal framework provides the foundation, but strong leadership and effective stakeholder engagement are crucial for successful implementation. Additionally, the presentation may briefly touch upon the potential implications for private procurement practices within the university's sphere of influence, encouraging suppliers to adopt sustainable practices.

Keywords

Public & Private Procurement; Leverage ESG Principles; ESG Compliance

50 | The relevance of sustainable lab practices

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Abstract

Scientists are of key importance to the society to advocate awareness of the climate crisis and its underlying scientific evidence and provide solutions for a sustainable future. As much as scientific research has led to great achievements and benefits, traditional laboratory practices come with unintended environmental consequences. Scientists, while providing solutions to climate problems and educating the young innovators of the future, are also part of the problem: excessive energy consumption, (hazardous) waste generation, and resource depletion. Through their own research operations, science, research and laboratories have a significant carbon footprint and contribute to the climate crisis.

Climate change requires a rapid response across all sectors of society, modeled by inspiring leaders. A broader scientific community that takes concrete actions would serve as an important step in convincing the general public of similar actions. Over the past years, grassroots movements across the sciences have recognized the overlooked impact of the scientific enterprise, and so-called Green Lab initiatives emerged seeking to address the environmental footprint of research. Driven by the voluntary efforts of researchers and staff, they educate peers, develop sustainability guidelines, write scientific publications and maintain accreditation frameworks.

With this perspective we advocate and spark leadership to promote a systemic change in laboratory practices and approach to research. Comprehensive evidence for the environmental impact of laboratories and their root-causes is presented, expanded with data from a current case study of the University of Groningen showcasing annual savings of 398 763 euros as well as 477.1 tons of CO₂e. This is followed by guidelines for sustainable lab practices and hands-on advice on how to achieve a systemic change at research institutions and industry. How can we expect industry, politics, and society to change, if we as scientists are not changing either? Scientists should lead by example and practice the change they want to see.

Keywords

Sustainability; laboratoria; perspective; case study

51 | Embedding Sustainability in the Leadership Curriculum: Case Study of a Doctoral Program for Scholar-Practitioners

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Abstract

The purpose of this paper is to present a case study of a small, private liberal arts college in the mid-Atlantic region of the United States that created a doctoral program in leadership for practicing leaders with sustainability as a core component of the curriculum. By embedding concepts of sustainability (Avery & Bergsteiner, 2011; Elkington, 2013) across courses in the leadership curriculum and providing opportunities for action and reflection (Schön, 2017; Kolb, 1984) through coursework and community engagement (Bridger & Alter, 2006), this program sought to develop a sustainability mindset (Rimnocy, 2021) in students to enable them to become agents of change in their communities. Insights from the design and implementation of this program are discussed.

Higher education institutions are key actors for sustainability and have a critical role in creating a sustainable future. In addition to the traditional role of offering education and conducting research, higher education institutions are increasingly being called upon to play a larger role in the economic, social and cultural development of their regions (Arbo & Benneworth, 2007). Cortese (2003) suggests that a paradigm shift toward a systemic perspective can be achieved by replacing traditional structures that perpetuate competition with open structures that invite collaboration and cooperation, complementing vertical rigor that encourages depth within a discipline with lateral rigor that welcomes interactions for interdisciplinary collaborations, and going beyond a focus on course content to highlighting connections among educational curriculum, research, and impact on economic, environmental, and social sustainability on local, regional and global communities. However, examples of a systemic perspective required for sustainability in higher education are still sparse. Fewer still are examples of educational programs that develop a sustainability mindset among students and actively encourage them to be agents of change in their communities in their leadership practice.

Hood College is an independent liberal arts college in Frederick, MD, less than an hour away from Washington, D.C., Baltimore, and Gettysburg. The geographical location offers the college many advantages in building partnerships at local, regional, and global levels. Founded in 1893, Hood College has prepared students for successful careers and the responsibilities of citizenship for more than 125 years, guided by its core values of Hope, Opportunity, Obligation, and Democracy (www.hood.edu). In 2015, a professor in management (the lead author) and a colleague from education envisioned an interdisciplinary scholar-practitioner doctorate that would serve mid to senior level professionals from education, business, government, and non-profit organizations. After a year-long process required for gaining approval from the College and the Middle States Commission on Higher Education, preparations began for starting the doctoral program in organizational leadership with an inaugural cohort in 2016. Under the leadership of the lead author, the mission and vision for the program were articulated which are reflected in a statement that has become symbolic of the program: "Preparing Leaders, Transforming Communities". A framework for the curriculum was designed to operationalize this statement with the following pillars: Mindful Leadership, Systems Thinking, Community Engagement, and Stewardship. Each of these pillars contributes to a sustainable approach to leadership. Core courses for the curriculum were developed by a team of faculty from across disciplines, introducing concepts from the four pillars into each course. Recognizing that drawing on the strength of the community was a critical component of community engagement, leaders-in-residence were selected from the community to share

their insights with students. As the first cohort engaged in the program, they actively co-designed additional features adding to the embeddedness of sustainability in the program. The first cohort shaped the dissertation criteria which ensured that research would result in the improvement and transformation of their organizations or communities. Dissertation research from this program has resulted in a wide range of outcomes across industries: improvements in education for disadvantaged children in K-12 schools, improved diversity in manufacturing organizations, initiatives for well-being among nurses in the veterinary profession, and much more. Another component of community engagement for students and alumni is the opportunity to serve on non-profit boards, further contributing to the growth of the community. As the program has grown, alumni contribute to the sustainability for the program as coaches, mentors, and facilitators in addition to their continuing leadership in their own organizations.

Keywords

higher education; sustainability; curriculum; doctorate; organizational leadership

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52 | A Sustainable Approach for Measuring Performance: Application of the Triple Bottom Line Balanced Scorecard (TBL-BSC) in an Academic Program Review

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Abstract

Higher Education Institutions can use self-assessments as a tool for effective strategic planning and organizational change (Ruben, 2007; Shriberg, 2002). The process of evaluation of strengths, as well as reflection on opportunities for improvement, provides the foundation for driving transformational change (Martin et al., 2001). However, such self-assessments can be indicators for sustainability only when they go beyond measuring current financial strength and use broader frameworks to “emphasize information and measurement for assessing, tracking, and promoting organizational excellence” (Ruben, 1999, p. 1). The Balanced Scorecard (Kaplan & Norton, 1999), widely used in business, can be an effective tool for strategic assessment and sustainable development in higher education (Camilleri, 2020; Stewart & Carpenter-Hubin, 2001; Brown, 2012; Yawson & Paros, 2023). The BSC was adapted in 2020 to meet the requirements of the Triple Bottom Line (Elkington, 2013). This paper describes the implementation of the Triple Bottom Line Balanced Scorecard (TBL BSC) for an Academic Program Review of a non-traditional program in a private liberal-arts college in the United States of America.

The Balanced Scorecard Framework

Kaplan and Norton (1992) introduced the BSC in recognition of the fact that while traditional financial performance measures worked well for the industrial era, they were not adequate for a global, technology-driven, competitive economic reality. Traditional financial accounting measures such as return-on-investment and earnings-per-share can be misleading when businesses are concerned with continuous improvement and innovation, which are critical activities when operating in a competitive environment. In addition to financial measures that reflect the results of actions already taken, the BSC includes operational measures on customer satisfaction, internal processes, and learning and growth. The BSC links four important performance measures: 1) the customer perspective to assess how the customer sees the organization, 2) the internal perspective to assess processes the organization needs to excel at, 3) the learning and growth innovation and learning perspective that aims to understand what needs to be done to continue to learn, improve, innovate and create value, and 4) the financial perspective which addresses how the organization looks to shareholders. This framework brings together these seemingly disparate elements to offer a holistic perspective on performance that emphasizes the value to all stakeholders and is future-focused. Thus, incorporating these drivers of future financial performance, the BSC is a more sustainable approach to assessing business performance.

Kaplan and McMillan (2020) updated the BSC to meet requirements of the triple bottom line (Elkington, 2013) which aims to take a balanced approach to creating economic, environmental, and social value. Accordingly, the Triple Bottom Line Balanced Scorecard (TBL BSC) refers to *Outcomes* to reflect each of the triple bottom line performance indicators, *Stakeholders* to reflect not just customers, but multiple participants in the ecosystem, and *Enablers* to capture learning and growth which is more inclusive and requires coordination across all stakeholders.

Application of the Balanced Scorecard for the Academic Program Review

The TBL-BSC framework was used as part of the Academic Program Review for a non-traditional program that the authors of this paper lead in a small, private college in the United States of America. The TBL-BSC framework was used because traditional metrics of enrollment against pre-set budget targets were found to be insufficient in assessing the performance and developing a long-term vision for the program.

Conclusion

By using the TBL-BSC framework for the Academic Program Review of a non-traditional program in a small, private college in the United States of America, this paper offers insights into the use of assessments in higher education institutions in accordance to the key principles of the TBL-BSC framework (Kaplan & McMillan, 2020): 1) Commitment to inclusive growth strategies that are conscious of the needs of internal and external stakeholders, 2) Take a strategic role in addressing environmental and societal issues, 3) Refine mission and objectives to the ecosystem, 4) Engage stakeholders in co-creation of goals, 5) Pursue inclusive growth strategies.

Keywords

higher education; sustainability; triple bottom line; balanced scorecard; performance assessment

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54 | Profiling a future-oriented business economist to reshape the curriculum for sustainability

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Abstract

As global challenges such as climate change, resource depletion, social inequality, and poor working conditions intensify, economists are faced with the imperative to re-evaluate traditional economic paradigms and embrace a more sustainable approach. Moreover, business economists occupy important positions in society, making daily decisions that might have adverse environmental and/or social impacts in the long run. Therefore, a business economist must be future-oriented, which implies considering the reciprocal impact between the actions of the people in their organization and the ecological and social environment in their day-to-day decisions.

This presupposes a thorough integration of sustainability competencies within the typical skillset of business economists. Furthermore, companies increasingly ask higher education institutions to adjust their curriculum to the competencies required for the circular economy (Janssens, Kuppens & Van Schoubroeck, 2020) and the implementation of the European Green Deal. Simultaneously, a growing body of literature on sustainability competencies emerged (Brundiers et al., 2021; Rieckmann, 2018; Wiek, Withycombe & Redmann, 2011), including a competence framework specially developed for sustainable entrepreneurship (Ploum et al., 2018). In addition, the Inner Development Goals initiative has been launched to provide the necessary transformational skills to achieve the Sustainable Development Goals. To come to a common understanding of sustainability competencies across Europe, the Joint Research Centre of the European Commission published its reference framework named Green-Comp (Bianchi et al., 2022), which served as a guide to making the business economics curriculum at Vrije Universiteit Brussel (VUB) more sustainable.

Towards a learning pathway for sustainability in the business economics curriculum

The Faculty of Social Sciences and Solvay Business School of VUB already introduced sustainability in the curriculum by creating elective courses such as ‘Decision Support for Sustainability’, ‘Sustainability: an Interdisciplinary Approach’, and ‘Sustainable Mobility and Logistics’. However, being elective courses, students could still graduate without having any sustainability competencies. Therefore, in 2020, the Faculty started a process (see Figure 1) to structurally implement a learning pathway on sustainability in their curricula.

The process started with a survey about sustainability competencies acquired by our students in business economics and business engineering. What came out of the survey was that the knowledge was very fragmented and superficial. Therefore, as a formal commitment, the Faculty decided to introduce sustainability in their strategic plan. Along the trajectory, a working group on sustainability was established. This informal group of concerned colleagues helped to co-create and support the further development of the rest of the process. They launched the idea for a new course on ‘Sustainability Economics’ as the

capstone course. This new course would fill the gaps in the curriculum, would be obligatory, and be positioned in the third bachelor year.

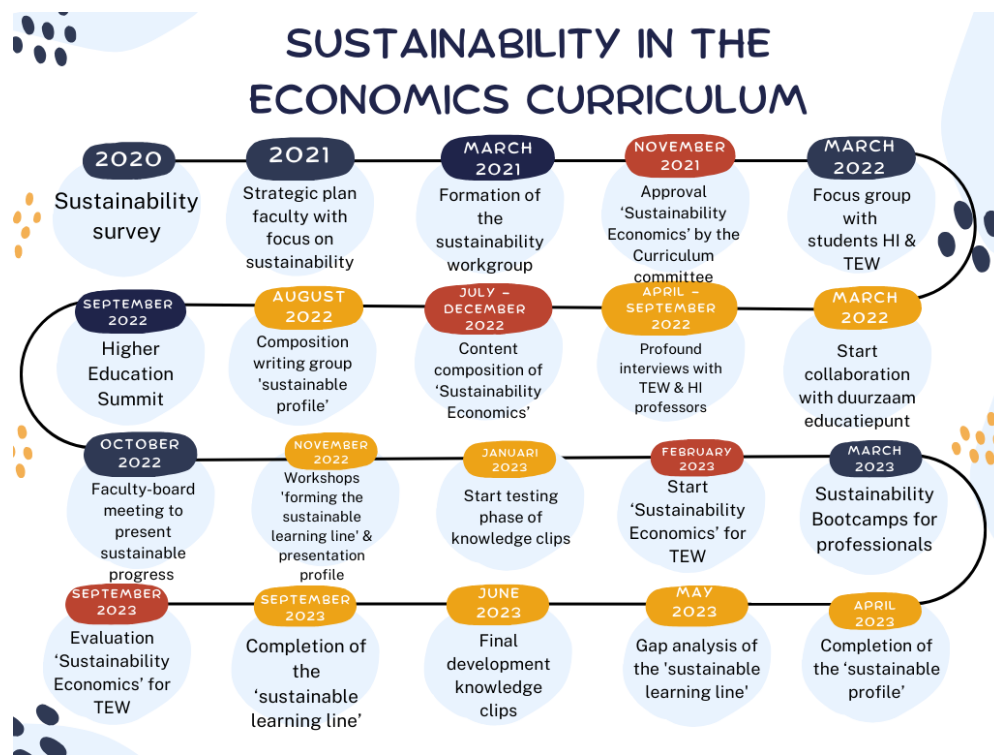


Figure 1: Sustainability learning pathway process at the Solvay Business School

As of 2022, the process was supported by the Sustainable Education Point of the Flemish Government to determine a shared vision across the faculty on a radically new profile of a future-oriented business economist. A writing group comprising students, staff, alumni, representatives of the business world, NGOs and the government, and experts in the field of sustainability and sustainability education was composed to determine this profile that would serve as a lighthouse to determine the gaps in the curriculum. Based on their input, scholars from the Brussels Research Institute for Teacher Education (BRITE) of VUB determined 12 characteristics of a future-oriented economist (see Figure 2).

According to this profile, a future-oriented business economist:

1. deploys their business knowledge in a targeted way for sustainable development;
2. uses the planetary and social boundaries as a compass;
3. follows (inter)national sustainability frameworks;
4. is a systems thinker;
5. thinks of the long run;
6. exhibits regenerative leadership;
7. takes a pluralistic view of the economy;
8. reports transparently on sustainability efforts;
9. is an entrepreneur with a multiple mission;
10. explores new business models in the circular and biobased economy;
11. is an inclusive entrepreneur;
12. can develop policy instruments to embed sustainability within organisations.

Keywords

sustainability economics; business education; business economics curriculum

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59 | Transformative Aspects of University Performance as Perceived by Students – Comparing the University of Warsaw and Charles University in Prague Sustainability Strategies

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Abstract

The importance of the learning environment for effective ESD has been underlined by UNESCO - the lead UN agency for initiating and implementing global initiatives to ensure that the principles of ESD are promoted through formal, non-formal and informal education around the world. Demand for transforming learning and training environment was the subject of the second priority action area of the *Global Action Programme (GAP)*, adopted by UNESCO in 2014 to scale up the actions and good practices of the *UN Decade of Education for Sustainable Development (2005-2014)*. The second priority action area of the GAP calls for the promotion *whole-institution approach* to ESD in schools. This includes a consistent approach to sustainability in school governance, teaching content and methodology, campus and facilities management and also refers to universities; in practice this principle is implemented by creating learning environments 'where learners learn what they live and live what they learn' (UNESCO, 2014). The whole institution/school approach has also been included in UNESCO's latest initiative: *ESD for 2030* – a global strategic framework that proposes actions in five priority action areas, highlighting the key role of ESD in the successful implementation of the 17 Sustainable Development Goals. (UNESCO, 2020). In both documents, priority action area 4 – *Empowering and mobilizing youth* – plays an important role.

The roadmap is set, but how does it look like in practice? There is growing academic debate on the prerequisites of sustainability transformation in universities which has many aspects: leadership (Leal Filho et al., 2020), issues of student participation (Boldrini, Delorme, 2023), partnership and involvement of actors (Chambers, et al., 2022), and specifically issues of higher education in the post-communist part of Europe (Dlouhá, et al., 2017). All these questions have no universal answer and should be observed with situational understanding in concrete university contexts. This is the intention of this contribution, which aims to present and analyse a case study from the two partner universities, the University of Warsaw and Charles University in Prague.

Recently, these universities have committed themselves to integrate sustainable development into all areas of university operations (University of Warsaw in 2021 and Charles University in Prague in 2023). To reflect on their implementation, the COPERNICUS Alliance (CA) representatives of the two universities started a project in January 2024, funded by the CA mini-grant fund. The aim was to raise students' awareness of the sustainability strategies of both universities and to involve them in sustainable development processes in this context. Several activities with students were jointly prepared, including formats such as group discussions, mind mapping, answering Slido questions, and a survey developed similarly for students from both cultural environments and translated into local languages. The research focused on the following questions

1. Are the University of Warsaw and Charles University in Prague promoting learner-led change?
2. Are students sufficiently recognised as agents of change towards sustainability at universities?

In order to initiate changes in which the younger generations should be actively involved, the authors used the actor analysis method combined with action research to initiate and reflect participatory processes in decision-making (Wittmayer, Schöpke, 2014). The first step in describing the possibilities for change at the university level was to compare the university strategies that both universities had already

adopted and were currently implementing (Ozsen, et al., 2023). Students were informed about these strategies and invited to think critically about the adopted measures and possible changes in university performance and life; they were also asked to outline their ideas of a sustainable university in which they would like to study. Several (above-mentioned) formats were used to receive their feedback, such as written text, pictures, mind maps, etc.; these students' responses and ideas were collected and analysed using qualitative methods. Two aspects of university transformation were mainly observed: i) how students perceive and value the university's compliance with its commitments and more general regulations (and what practical steps they propose to achieve this), ii) what they could creatively imagine in terms of their 'ideal study spaces'. Emerging, often innovative, ideas were collected, coded and grouped into different categories for comparison with relevant action areas in each university's strategy. Within each category, different student approaches were identified, such as critical viewpoints and constructive, forward-looking feedback, with some innovative ideas, but also limits to their personal involvement. In general, students were more interested in receiving relevant information and developing expertise on SD aspects of their discipline than in taking individual action. In CR, the efforts to develop a relevant knowledge base were important, while in Poland students were guided to develop projects with practical relevance. As the students are important university stakeholders, their opinions can be the turning point in the sustainability transformation of university management practices. However, they need careful guidance to do so – students' empowerment to initiate incremental change is still low and should be encouraged through appropriate lectures, courses or coordinated practical actions, some of which have been documented in both universities. The final outcome of this (multi-format) dialogue with students was presented as a proposal to the university management.

The University of Warsaw and Charles University in Prague are two major universities in the capitals of geopolitically close countries. Both universities are of similar prestige and importance, and both are modern scientific institutions with a historical past. This is reflected in the extensive infrastructure of both educational institutions, where modernity and historical heritage coexist. There are already many possibilities for cooperation between Warsaw University and Charles University in Prague: the 4EU+ European University Alliance, the Erasmus programme and cooperation within the Copernicus Alliance. However, after the end of the UE4SD project (2013-2016), the cooperation between the two universities in the field of education for sustainable development is not sustainable enough. The joint project of the two universities could be a good starting point for new effective cooperation in the field of ESD.

Keywords

university; sustainability strategy; whole-institution approach; students' participation; action research

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60 | Reading between the (grey) lines. An interdisciplinary approach to education for sustainability and wellbeing in lower-grade classroom settings based on reading literacy and GreenComp

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Abstract

UNESCO (2021) increasingly encourages interdisciplinary approaches in the education system to address complex phenomena such as climate change and plant awareness disparity (PAD), to promote the development of competences related to sustainability and GreenComp, and to raise awareness on interconnectedness between the ‘human’ and the ‘non-human’.

Given the assumption that the human/non-human interconnectedness is crucial for the development of sustainability-oriented values, actions, and knowledge, it is necessary to situate this research within an interdisciplinary framework which encompasses pedagogy, subject-specific didactics (in this case, Italian as primary language in kindergartens and primary schools), geography, psychology and Critical Plant Studies.

As suggested by various research works on Education for Sustainability (Efs), the experience of creating informal and non-hierarchical meeting contexts seems to be a privileged tool for developing such shared curricula. This is because multilateral backgrounds such as the ones designed for specific meetings and workshops offer creative and innovative growth opportunities which allow each participant to mutually interact and to learn from each other.

The same concept (although not as monitored and supervised as in specifically designed contexts as described above) can be found in environments such as lower-grade primary schools or kindergartens. In these specific school settings, which are often less rigidly structured compared to traditional classrooms with a blackboard and multiple rows of desks and chairs, it is indeed possible to consider incorporating sustainability discourse from a very young age – opting for *curricula* transformation more oriented towards PAD.

Such transformation is possible first and foremost by reintroducing live beings in educational contexts, namely plants («active subjects» as suggested in XXX, 2022), and by building a relationship with them while rearranging the context itself. Didactic means such as picture books, frequently used in kindergartens for their versatility, can be of great help in order to teach kids how to deeply reconnect with the non-human surrounding them.

Indeed, the focus of this proposal is the interdisciplinary approach between literature and wellbeing aimed at promoting GreenComp and sustainable-oriented habits from a very young age. The dichotomy between indoor and outdoor settings (both physical and metaphorical) present in the picture book *Where the trees grow* (Kang-mi, 2021) has been previously studied by the authors of the current proposal. These findings will indeed serve as the starting point for further inquiries in the field of PAD education – which include the previously mentioned theoretical framework as well as a modern approach to language didactics, specifically Italian as first language, based on first-person approaches and Kolb’s experiential theory (cfr. Kolb, 1984).

The methodology used for the developmental part of the previously-mentioned research remains the same: a multiple case-study involving student teachers for lower-grade schools – namely kindergarten. Furthermore, in the following proposal, the definition of *reading literacy* elaborated by the Organization for Economic Cooperation and Development (OECD) in its latest revision for the 2018 PISA assess-

ment has been taken into account: «Reading literacy is understanding, using, evaluating, reflecting on and engaging with texts in order to achieve one's goals, to develop one's knowledge and potential and to participate in society» (OECD, 2019, p. 35).

Although it is not possible to specifically talk about a “reading literacy” in kindergarten (as pupils of that age are still far from individually process texts in a way an older reader would), it is already possible for pupils to actively engage with texts and ideas, to develop a broader sense of connection with the environment. This aligns with the previously mentioned PAD oriented *curricula* transformation and the early engagement with GreenComp awareness. In this context, the term “reading literacy” is used to denote the active, purposeful, and functional application of reading in a range of situations and for various purposes (OECD, 2019, p. 37) – which is the focus of this work.

Crucial to this proposal and its framework (as well as to the goals of this experience) are the following criteria: individualization, activity, multisensoriality, sense of place attachment, and naturality. The aim is to develop educational practices that encourage respect and care for the environment. With younger children, picture books serve as the best possible medium for these practices, which will also help them develop their reading literacy competences. The goal is to prompt teachers and students to reflect on the models that can contribute to the realization of this ideal space. From a very young age, modifying our surroundings is a necessity, enabling us to appropriate such space and tangibly transpose our internal emotional space (cfr. Colombo, 2019a; Colombo, 2019b; Dozza in Baldacci & Zabalza, 2019).

In conclusion, the concrete stimuli and observations gathered in classrooms by teachers, which will be presented and discussed at the conference, serve the primary purpose of fostering awareness and reflection among teachers and students regarding new up-to-date *curricula* that consider PAD as one of their main topics. Understanding the context as comprising not only physical space but also non-physical relationships is crucial in this approach. This cooperative context can only be built through the interaction of multiple actors on different levels. Therefore, it is very important to understand that living beings are not merely “space-filling” and static elements; rather, they serve as “educators” in their own means, with whom students (and teachers) need to learn to interact.

Keywords

Institutional wellbeing education; Reading literacy; Nature Deficit Disorder; Multi-sensorial teaching; Pedagogy.

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61 | Integrating sustainability into clinical laboratories

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Abstract

The escalating environmental footprint of healthcare facilities, particularly clinical laboratories, necessitates a critical reevaluation of operational sustainability. Clinical laboratories, known for their significant energy and water consumption, represent a pivotal area for intervention. Our initiative, started in the Laboratory Medicine Unit at the University of Padova, targets the integration of sustainable practices within the routine activities of clinical laboratories to mitigate their environmental impact.

The project employed a comprehensive approach, starting with the identification and understanding of external and internal factors influencing sustainability in clinical settings. Key interventions included optimizing energy management, particularly focusing on refrigeration units' energy consumption, and implementing waste management strategies. A cost-benefit analysis of energy consumption, focusing on laboratory refrigerators and freezers, was conducted to identify areas for improvement. This analysis was complemented by an operational review and the participation in the Freezer Challenge 2024, aiming at enhancing the sustainability of refrigeration practices.

Preliminary findings highlighted the necessity of rationalizing refrigeration units and reorganizing the storage of materials within Ultra-Low Temperature (ULT) freezers from an energy-saving perspective. Significant energy consumption reductions were projected by transitioning to more energy-efficient practices, including the optimization of refrigeration units and the adoption of more sustainable waste management protocols. These initiatives are expected to serve as a foundation for broader sustainable practices within the laboratory.

The project underscores the potential of targeted interventions in significantly reducing the environmental impact of clinical laboratories. By focusing on energy management and waste reduction, it demonstrates that sustainability in healthcare settings is not only an ethical imperative but also a feasible and potentially cost-saving endeavor. A future pivotal element of this project will be actively engaging the laboratory staff in sustainability efforts, recognizing that informed and incentivized personnel are instrumental in driving environmental improvements. Future efforts will expand to include broader sustainability initiatives, such as reducing overall energy consumption and promoting recycling, thereby fostering a culture of environmental responsibility within healthcare facilities and making laboratory personnel key players in the sustainability transformation.

This initiative also incorporates an educational dimension designed to involve and train students in sustainable practices, emphasizing the transformative role of education in promoting environmental stewardship in clinical settings. A specialized curriculum module would be developed for students in medical and biological sciences, that combines theoretical knowledge with practical activities aimed at reducing the laboratories' ecological footprint. This module will be available as an optional university course. Students will engage in a series of practical activities. They will conduct energy audits to identify inefficient energy use across laboratory equipment, helping to pinpoint opportunities for energy conservation. Waste audits will allow students to measure and categorize waste, leading to improved waste management strategies that emphasize reduction, recycling, and proper disposal. Additionally, sustainability workshops will introduce students to green chemistry principles, which aim to minimize the use and generation of hazardous substances. Students also will work on optimizing laboratory protocols, which involves making adjustments to reduce the consumption of water, energy, and laboratory consumables. Another key activity involves promoting the sharing of equipment to maximize usage efficiency and reduce redundant energy consumption. Students will learn about green procurement

practices, helping the lab source environmentally friendly materials and equipment. They may use simulation software to model laboratory setups and predict environmental impacts before practical implementation. Students will also prepare sustainability reports to document improvements and ongoing challenges in laboratory environmental performance. Lastly, organizing community science events will allow students to showcase sustainable laboratory practices to the public, raising awareness about the importance of environmental stewardship within scientific research settings.

By integrating academic learning with practical implementation, the initiative prepares a new generation of healthcare professionals committed to environmental stewardship.

Keywords

Energy Management; Green Lab; Clinical Laboratory Sustainability

62 | The Power of Co-Creation: Fostering Transformation in Sustainability Education

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Abstract

The climate crisis is a complex, systemic issue embedded within interconnected environmental, social, and economic systems. The urgency of the climate crisis demands the next generation of students are equipped with the knowledge and skills to navigate this complexity. Many models, including the iceberg model, highlight the need for a deeper understanding that goes beyond surface-level analyses.

Therefore, teaching approaches in sustainability education should focus on building competencies such as critical thinking, system thinking, and teamwork to empower future generations. This aligns perfectly with the Inner Development Goals framework proposed by a network of researchers to accelerate progress towards sustainable development goals. This framework have defined many skills including system thinking, critical thinking, optimism and co-creation, among others as transformational skills required for sustainable development. However, traditional educational approaches often fall short in achieving this transformational impact, necessitating innovative approaches.

This paper presents the adoption of co-creating narratives with Higher Education students as a way to facilitate understanding and transformation. Co-creation, a collaborative knowledge-building process, offers a promising avenue for fostering transformative learning in higher education^[i]. By harnessing the collective intelligence of a group, co-creation sparks innovation and empowers learners, making it a powerful approach in today's knowledge-driven world where collaboration and critical thinking are key. Co-creation empowers students to become active participants in their learning, working together to grapple with real-world problems and co-create solutions^[ii]. This can take many forms, from co-designing learning activities to collaborating on real-world projects. In the 2023/24 academic session's first semester, within the course 'Sustainability: An Interdisciplinary Approach (SIA)' taught at Vrije Universiteit Brussel (VUB), we engaged in co-creation with students to develop a positive narrative of a possible future, resulting in a book titled «The Land of Hope.» The aim was to empower students to become agents of change through fostering critical and systems thinking to understand the interconnectedness of the climate crisis and identifying leverage points for positive change. This approach also moves from the discourse of despair to hope, ultimately sparking action.

The course, SIA, follows a well-established three-track structure to facilitate student learning. The first track features themed sessions on sustainable development, presenting the limitations and positive developments in various sectors (such as food, mobility, governance, etc.) through expert-led frontal lessons. The second track, empowerment sessions, focuses on equipping students to tackle «wicked problems» through workshops and exercises introducing theories like transition theory and leverage points. And third track is the co-creation project where groups of students work on different sectors. During the second track, students also participated in the Polak game, design fiction, scenario analysis and storytelling workshops. In addition to this, the course ditched the traditional examination approach for an analytical socio-technical scan template and self-reflexive question to encourage identification of change on a personal level.

Surveys were collected to analyse students' opinions and emotions before and after the exercises. Response revealed initial skepticism of students in engaging in a non-traditional academic exercises. Nevertheless, analysis revealed a significant worldview shift among students (75%+) after engaging in creating hopeful climate narratives. Responses also show an acknowledgement of a deeper understanding of the

climate crisis. Additionally, students were able identify points for sustainable interventions as well as the required resources (capitals) required to achieve them. An interesting revelation is the change in students' perception of self-agency during and after the course. Although the overwhelming majority of the students had identified as Pessimists without the ability to effect changes during the Polak game^[iii], the survey revealed a notable change in this perception upon the completion of the course.

This case revealed significant findings regarding the effectiveness of co-creation in sustainability education. Through engagement in co-creation activities within the «Sustainability: An Interdisciplinary Approach (SIA)» course at Vrije Universiteit Brussel (VUB), students exhibited a notable shift in their worldviews, with a considerable percentage transitioning from pessimism to a more optimistic outlook regarding their ability to effect change in addressing the climate crisis. Moreover, participants demonstrated a deeper understanding of the interconnected nature of the climate crisis, identifying points for sustainable interventions and the resources required for implementation. These findings underscore the transformative potential of co-creation in sustainability education, providing valuable insights for curriculum design, pedagogical practices, and educational policy. By fostering critical thinking, collaboration, and active engagement among students, co-creation initiatives offer a promising avenue for empowering future generations to understand, engage with, and address complex sustainability challenges such as the climate crisis.

Although this case study presents a promising potential for tangible co-creation projects as part of sustainability education, it draws from a very small sample of students. Subsequently, adopting this approach across different levels and disciplines in higher education for sustainability education could lead to an even better understanding of its possibilities. Nonetheless, current insights have broader implications for advancing sustainability literacy and action in higher education and beyond. Future research should assess the long-term impact of this approach.

Keywords

Co-creation, Sustainability, Transformative learning

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^[i] Bovill, C. (2020). Co-creation in learning and teaching: the case for a whole-class approach in higher education. *Higher education*, 79(6), 1023-1037.

^[ii] Ibid

^[iii] <https://oecd-opsi.org/toolkits/polak-game/>

68 | “Don’t say sustainability!”: moving from commonplaces to places. Higher education students experience of a place-based teaching course in education for sustainability

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Abstract

Universities play a crucial role towards sustainability and they are recognized as key agents in the process of implementing the Sustainable Development Goals (Leal Filho et al., 2019). In particular, a prominent role belongs to those teaching courses directly addressing the topic of education for sustainability.

Beyond this, universities should promote a critical reflection on the modality and coherence of public debate on education and sustainability (Kopnina, 2020), to prevent jeopardizing and misunderstandings that may delay the ecological transition. In this sense, it must be considered those instances that even question the use of the term sustainability since its generality and omnipresence may lead to jeopardize rather than to clarify specific issues (Jickling & Sterling, 2017). The gap between rhetoric and reality in the context of sustainability actions and debates has long been pointed out and discussed (Myers & Macnaghten, 1998). Therefore, the greenwashing represents a challenge even in the context of higher education (Álvarez-García & Sureda-Negre, 2023), including education for sustainability.

In response to the complex challenge of education for sustainability in Anthropocene era (Nørreklit & Paulsen, 2022), teaching and learning approaches must aim to promote complex and critical thinking, capable of problematizing issues from the distinctiveness of different environmental, cultural economic and social contexts by placing themselves in dialogue with indigenous cultures as well as nonhuman life (Blenkinsop, Morse & Jickling, 2022; Quay, 2021).

Among the various pedagogical approaches, place-based education (Sobel, 2017) is characterized by emphasizing the educational value of the relationship with place, considered in the complexity of its dimensions, through direct experience within learning pathways but outside the traditional classroom. This approach is also intended to foster a critical attitude to what may emerge in practice (Gruenewald, 2008). Such approaches are placed in the broader spectrum of outdoor pedagogies (Bortolotti, 2019) where the cognitive dimension is intertwined with the experiential one, involving the body and senses, the exploration, the stories and local knowledge as well as in the objects and landscape.

Starting from this problematic background, in the light the place-based educational approach, this paper aims

- 1) to present the education for sustainability workshop developed at the University of Venice in the academic years 2022/2023 and 2023/2024 at Ca’ Foscari International College;
- 2) to explore the experience of the involved students through a phenomenological analysis, to understand whether and how a place-based learning experience in higher education contributes to their understanding of the issue of sustainability.

Ca’ Foscari International College is an honors university college which attracts high-achieving students from Italy and abroad. In addition to the courses offered by the University, the International College students can choose among three minor courses, one is committed to sustainability. The «Laboratory of sustainability» allows the students to familiarize themselves with processes and tools to envision sustainability goals and define relevant criteria in real-life scenarios.

In particular, this course addresses the problem of water scarcity and usage in northern Italy, considering

its multiple functions, the fair access to water and the strategies to manage the water needs. Despite this definition, a problem occurs when talking about the “sustainable use of water” since its large and undefined meaning. All the participants, both professors, students and external experts will be forbidden to use the word “sustainability”, being forced to clarify the meaning, goals and significance of their experience. Field trips are the core of the course aiming at providing students with a hands-on experience of the principal players - places and people - of water management along the Adige river. In the two years explored in this paper 8 students have been involved, male and female, with different academic backgrounds.

The qualitative empirical investigation explores the experience of the students through the analysis of materials such as learning diaries and focus groups conducted during the course and semi-structured interviews conducted at the end of the teaching activities. The collected material is analyzed following the mainly inductive approach of empirical phenomenology (Mortari et al., 2023).

The paper explore these two research questions:

How do the students perceive a place based course in the area of education for sustainability?

How does the particular teaching approach frame their understanding of sustainability?

Despite of the small number of students involved in the research, an in-depth understanding of the learning experience can offer useful insights towards the improvement of educational offer as well as suggest further exploration of students’ attitudes, pre-understandings, and educational experiences with respect to a topic so relevant to the future of institutions and the planet.

Keywords

higher education; place based education; sustainability; student experience; water management

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73 | AI Literacy as a Threshold Concept: Fostering Sustainable AI Education

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Abstract

The rapid developments in the field of artificial intelligence (AI) and Large Language Models (LLMs), in particular, clearly indicate the growing need for the teaching of basic AI competencies (AI literacy) as part of a sound and sustainable university education embracing digital transformation (United Nations Sustainable Development, 2023). According to Long and Magerko (2020, p. 2), AI literacy is defined as “a set of competencies that enables individuals to critically evaluate AI technologies; communicate and collaborate effectively with AI; and use AI as a tool online, at home, and in the workplace.” Among others, these competencies include the ability to recognize AI-based tools, a fundamental understanding of how artificial intelligence operates, an understanding of the strengths and weaknesses of AI, a reflection of the human role and ethics regarding AI, and an understanding of the programmability of AI agents (Long & Magerko, 2020, pp. 4-8).

Identified as one of the 21st Century Skills (Casal-Otero et al., 2023; Ng et al., 2023; OECD, 2019; Southworth et al., 2023; Van Laar et al., 2017, p. 578; World Economic Forum (WEF), 2018, p. 37), students need to learn how to use AI tools in a critically reflective manner to become competent “managers of AI,” as Cardon et al. (2023, p. 277) explained. In their view, AI literacy emphasizes the practical and responsible application of AI tools beyond a basic comprehension of digital abilities. This should also include addressing ethical concerns in the implementation of AI in education, emphasizing transparency, bias mitigation, data protection, collaboration, and accountability to ensure ethical AI use (D’Souza et al., 2024, p. 1-2) as well as the critical reflection of the impact that AI technologies have with regard to environmental sustainability, such as their ecological footprint caused by high energy consumption and greater emissions (Floridi, 2024, p. 7-8).

Since AI literacy has significantly gained in importance and is likely to continue to be of great relevance, it might be reasonable to regard it as a key concept in higher education. In fact, it might be conducive to define it as a “threshold concept,” following Meyer and Land (2003). According to them, A threshold concept can be considered as akin to a portal, opening up a new and previously inaccessible way of thinking about something. It represents a transformed way of understanding, or interpreting, or viewing something without which the learner cannot progress. As a consequence of comprehending a threshold concept there may thus be a transformed internal view of subject matter, subject landscape, or even world view. (Meyer & Land, 2003, p. 1)

In other words, a threshold concept can be viewed as a “transitional point or intersection,” helping the learners navigate their way through a “transformational landscape” – such as the continuously changing AI landscape (Meyer & Land, 2005, p. 379). Due to these characteristics, threshold concepts have become quite popular and accepted in educational theory (Nicola-Richmond, 2018, p. 101).

Inspired by Meyer and Land’s work, we thus propose conceptualizing AI literacy as a threshold concept in the broader sense and to integrate AI literacy into higher education teaching as a “key point of curricula” (Kilgour et al., 2019, p. 1417). We believe that this approach is highly promising to foster this key 21st Century Skill as part of a socially sustainable, future-proof education and to thereby transform higher education long-term. In this conference paper, we would like to explore how this approach could be realized, based on the findings from a research project which we conducted in the academic year of 2023/2024. With this, we hope to make a relevant contribution to the field of sustainable AI education.

About the Project

The aforementioned project was funded by the School of Business (HSW) at the University of Applied Sciences and Arts Northwestern Switzerland (FHNW) as part of an initiative to incorporate these new technologies into higher education, which “requires updating educational systems” across whole institutions, including professional development (González-Pérez & Ramírez-Montoya, 2022, p. 2). The aim was to bring about a sustainability-oriented transformation.

The project yielded the development of different workshops that lecturers across the different schools (and soon beyond) could flexibly integrate into their own teaching. The objective was, on the one hand, to support lecturers with AI-related teaching materials. On the other hand, the workshops were supposed to proactively introduce undergraduate students to a selection of carefully curated AI tools, to work with these tools, and to critically reflect on and discuss their individual benefits and limitations, thereby enhancing students’ AI literacy skills as part of a future-oriented and equitable quality education, as defined by the United Nations’ Sustainable Development Goals (THE 17 GOALS | Sustainable Development, n.d., Goal 4).

More precisely, the project focused on the teaching of academic and business writing skills against the backdrop of recent advancements in AI and LLMs, as this area has been particularly impacted and challenged by these new technologies. While traditional didactic methods for the teaching of (scientific) writing practice continue to be relevant, it has become clear that a new approach including a focus on AI literacy skills is needed (Buck & Limburg, 2023, p. 76). For example, students need to know how to employ AI tools effectively while at the same time adhering to academic integrity standards; they need to become aware of precarious limitations such as gender bias; and students should be trained to recognize that AI tools can be a useful asset in the learning and writing process but cannot replace actual writing skills.

Preliminary results, not yet published, from a pre-post survey, which was conducted as part of this project, indicate that the workshops were not only appreciated by the majority of students, but also increased their overall AI literacy skills. This seems to corroborate our idea that defining AI literacy as a threshold concept is a worthwhile approach.

Keywords

AI literacy; threshold concepts; higher education; sustainability; 21st century skills

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74 | How to practice life-friendly education? Theoretical reflections and practice experiences from art education, in Denmark and in Italy

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Abstract

The climatically increasingly unstable times we are living in have been defined Anthropocene to describe an epoch in earth's history in which human activities have become dominant, with negative effects on all strata of the life-critical zone slightly below and above the surface of the earth (Latour, 2017; Ellis, 2018). For over a century there have been authors who have explored the problematic relationship with the living world, that is typical of modernity, described as an era of separation between nature and humanity (Guardini, 1993) and of exile from the living (Benasayag & Cany, 2022). A condition of earth and life forgetfulness (Paulsen, 2022) which from an educational point of view requires complex responses and not the simple adaptation of strategies that are part of the problem (Nørreklit & Paulsen, 2022).

In this direction, live friendly education may be seen as *a life-disclosing practice: grounded in a profound "openness" to life*. This paradigm challenges traditional delineations, such as indoor vs. outdoor and human vs. non-human. It suggests that life seamlessly intertwines with all human endeavors. Opposing modernity's inclination to establish societal structures based on life-forgetfulness, it advocates educational models that 1) refrain from domineering and controlling stances, and 2) unveil life's self-creative and regenerative essence (Nørreklit and Paulsen, 2023).

Art education seems to be a meaningful practice in order to embrace a life-friendly education: the different languages of art tend to give values to other ways of knowledge and learning, not only rationalist or technical, to be open to the embodied dimension of human existence in the world, to develop processes out of the logic of control and in emergent ways. Art seems to be a form of relation between humans and other than humans, but we have to consider the different approaches that can shape this relation. In this paper we suggest a distinction between at least 3 approaches:

The first approach 'the compensatory modern' uses more-than-human landscapes as 'inspiration' for artistic production as re- presentation e.g. in painting or sculpture. The second approach 'the anthropocene disillusional' uses art to criticize human activities and how they transform the environment. The third approach 'the life-centric open' uses art to open up relationships with life and the living world, otherwise neglected or closed-off. From an educational point of view, such artistic events can frame educational experience where the subject is fostered to be in dialogue with the world (Biesta, 2017).

After the exploration of the theoretical framework of life-friendly education in the context of art education, the paper discusses two practices. The first practice has been experimented in Denmark, in the context of informal art education in civil society. It involves both young people, and adults, who are invited to experiment with their relationship toward a specific place, but also share memories together about significant life experiences in their past. The experiment is framed by ideas coming from new Daoism and environmental philosophy (Nelson, 2020), around the concept wuwei (literally meaning doing-nothing) as a strategy to become open to and attuned to ziran (meaning life, in this context). The sharing of memories of past life experiences around a fire, focus on what Bron Taylor has named eye-to-eye-epiphanies (Taylor, 2010). The two exercises form an artistic practice and educational event

as well, where non-controlling relationships with the living world are aimed for. In the paper we discuss how the different participants respond to such invitations that goes beyond standard techno-bureaucratic mainstream education (Roy, 2003).

The second one has been implemented in Italy, in the context of upper secondary school. It involves adolescent male and female students in place-based creative writings practice, connected to the curriculum of language education. Teachers explore different places of the neighborhood as living educational contexts, where experiment observation and nature writing, in narrative and poetic forms. The texts written by the students and their perceptions explored by focus groups and interviews have been analyzed. In this paper we describe the educational practice and report the main research findings: the entanglement between embodied and verbal dimensions of experience, a deeper sense of attention, a sense of freedom from institutional schooling time and space.

Key results of the analyzed practices are: 1) They make participants potentially aware of the value and importance of the more-than-human living world and life as such; 2) They cultivate non-dominating and non-controlling attitudes towards life and the living world, 3) They disrupt and go beyond standard modern ways of schooling and institutionalization, 4) they can lead to deeper attentiveness and perhaps also 'peaceful' states of being-in-the-world, 5) they can open up artistic practices that are inclusive and goes beyond modern artistic practices like looking at paintings on a museum. In contrast to these 'positive' findings, we also speculate that it might be difficult to integrate such practices on larger scales into formal education to transform the educational system more radically to become 'life-friendly education'.

Keywords

Life-friendly Education; Arts Education; Outdoor Education; Place-based Writing.

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77 | Teaching sustainability transversally to large groups: Exploring Perspectives on a Compulsory Sustainability Module in a Portuguese University

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Abstract

Teaching sustainability in a way that the desired messages get across, inspire reflection and action constitutes a constant challenge. This challenge amplifies when working with large groups. Certainly, the way teaching sustainability is approached is also influenced by the institutional culture, vision and understanding of sustainability, and whether or not the institution follows a whole-institution approach (WIA) (Kohl et al., 2021). Many higher education institutions today claim to embrace this approach, without necessarily expanding on UNESCO's notion of 'enabling learning environments for Education for Sustainable Development (ESD)' (UNESCO, 2020) or only following partially the common understanding which defines the 'whole-institution approach' as integrating sustainability across all aspects of educational organisations (Holst, 2023). Identifying its practical application and implementation remains difficult (Kohl et al., 2021). Teaching sustainability and pedagogical choices still rather depend on the engaged efforts of enthusiastic staff than on being aligned with the core principles of a WIA, therefore calling for a broader discussion about curricula renewal.

This paper aims to contribute to the discussion about implementing sustainability in inter- and cross-disciplinary curricula (Weiss et al., 2021) by reflecting critically upon students' feedback (n=340) on a five-week-long mandatory transversal module on sustainability, integrated in the course "Society, Sustainability and Digital Transformation" of 3 ECTS, held at NOVA School for Science and Technology, NOVA University Lisbon, Portugal. This course is mandatory for all second-year bachelor students enrolled in one of the 18 bachelor's degrees related to technological and engineering sciences. The course is composed of three modules (society (30 hours), sustainability (15 hours), and digital transformation (15 hours)) which run simultaneously over the five weeks. While the university is still on the road towards developing a WIA, this transversal course has been ongoing for three years and constitutes a novelty in Portuguese engineering courses and within the Portuguese higher education sector.

Since the course is usually attended by approx. 1000 students every year, it requires specific logistics, dividing the students into mixed classes of 50-60 students that are taught by 21 teachers in total, of which eight teach the module on sustainability (usually consisting of a mix of professors, researchers/postdocs, and doctoral students). So far, each module is rather independent and follows its own programme, methods, and assessment. The sustainability module is based on systems thinking and was run under the guiding theme "Envisioning a sustainable world - From vision to action: co-construction of a sustainable path to achieve the SDGs". The main objectives of the module are to show the interconnectedness of global and local sustainability challenges, and to make students familiar with an integrative perspective of complex and dynamic problems. In self-directed and interdisciplinary group works, students are then encouraged to apply a systems perspective on a specific problem of their interest related to at least one of the SDGs. First, they jointly develop a transversal vision and then a respective action plan, using back casting. In the final session of each cohort, all groups present their action plans and how they are linked to specific SDG targets.

This research follows a mixed-methods design: We combine quantitative data analysis of the results

collected via an online feedback survey administered to all students (n=980) who participated in this year's sustainability module (340 answers received, response rate 35%) with a reflective hermeneutic perspective (Bernstein, 1982) of the teaching team (n=8) to analyse students' responses and discuss them critically against the course objectives, design, teaching approach, students' performance in their group works and (limiting) institutional factors. Institutional policy documents and curricula strategies of NOVA University Lisbon will be included in the analysis and compared to the latest ESD research as well as to the students' feedback on the module.

Results show that the majority (63%) of the respondents agree that the module contributed to expanding their sustainability knowledge. With varying degrees of agreement on a 5-point Likert scale, in most cases, respondents partially or totally agree to understand better the concept of sustainability, its importance for different knowledge fields, the complexity and how sustainability plays a role in their specific study fields. However, considerably fewer students agree to the affirmation of having curiosity to explore the topics further (31% partially agree, 18% totally agree), while 18% declare not to have further curiosity. Overall, almost half of the respondents consider the module as having been "useful" and 11.5% as "very useful". A considerable number of students (65, 19% of respondents) left qualitative feedback in making suggestions for improvement, e.g., in relation to teaching styles, the assignment and assessment, and the overall course organization, suggesting a better articulation of the three modules. Overall, six qualitative codes were identified, being the category "more interactive pedagogies / dynamic approaches" and "improvements for structure / format" the most frequent ones.

The overload of simultaneous assignments of the whole course and the wish for more interactive pedagogies can be seen as the main reason for students feeling tired at the end of the course, impacting thereby also the feedback of the sustainability module. While the overall students' feedback is positive, the results appoint to some weaknesses, especially with regard to the structure and format of the whole course Society, Sustainability and Digital Transformation:

- A more integrated approach between all three modules would be helpful to address some of the shortcomings (e.g. too many groups and too many presentations at the same time: ~10 groups/cohort of 50 students = 10 presentations per cohort in only one module. It's tiring for both students and teachers, who often even teach several cohorts.)
- The overall teaching approach is particularly challenging for large groups: While interactive pedagogies were used (visioning exercise, student-led and interdisciplinary group work, backcasting exercise), their application seem to have only been partially successful in this module. Some students even prefer a more lecture-style format for initial inputs – finding the right balance it's another challenge.
- More joint efforts are needed to advance and put in practice a whole-institution approach.

Regarding the limitations of this study, we acknowledge that the questionnaire only explored opinions for one module and not for the whole course. Furthermore, gender will be included in next studies.

This paper provided insights on aspects to consider when teaching sustainability transversally to a large number of students and how to overcome current drawbacks, especially considering the students' perspective. The current structure of three modules with its respective teaching hours reflects the current institutional's tentative of adapting existing courses to new demands and include sustainability where it was not included before (as in this case). Curricula adaptation and renewal is an ongoing process and this study aims to contribute constructively to further developments. At the moment, adaptations to the current course and a new optional transversal course on the SDGs for all NOVA students are being prepared.

This paper advances the curricula discussion towards more integrative forms of curriculum development for sustainability and contribute to enhancing teaching approaches that do justice to prepare students for the complex socio-ecological challenges ahead.

Keywords

Inter- and crossdisciplinary curricula; students feedback; learning for sustainability

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82 | How a Portuguese School of Engineering Contributes to Sustainable Development – The FEUP Case

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Abstract

Higher Education Institutions (HEIs) play a crucial role in the development of sustainable societies (Findler et al., 2019), and thus initiatives related to education for sustainable development (ESD) should act as a catalyst for that achievement. Since the 1970s, HEIs have undertaken several efforts to embed sustainable development into their system (Lozano et al., 2015). Additionally, the Agenda 2030, adopted by the United Nations in 2015, and in particular the Sustainable Development Goal (SDG) 4, provide a further impetus for the commitment of HEIs towards sustainable development. Thus, as agents of change, universities must play a significant role in the transformative process driven by Sustainable Development Goals (SDGs) (Leal Filho et al., 2019).

According to UNESCO (2021), the creation of sustainability competencies in engineering education is crucial to ensure that there is an adequate number of engineers able to address global challenges such as global warming, population growth and urbanisation, which require emerging and innovative technology-based solutions. Engineers need to provide solutions to these new social challenges to guarantee the quality of life for both present and future generations.

Although no specific legislation for higher education exists concerning the implementation of sustainability-oriented strategies in Portugal, the Faculty of Engineering of the University of Porto (FEUP) has long been aware of its important role as an agent of change through EDS and as a model of sustainability. FEUP is deeply committed to sustainable development, focusing on the following strategic areas: i) education; ii) research; iii) community; iv) operations; and v) outreach.

To illustrate the FEUP's commitment to sustainable development, some facts and examples are provided below:

- FEUP was the first Portuguese higher education institution to publish its sustainability report in 2006;
- since 2009, it is a member of the Environmental Association for Universities and Colleges to learn and share best sustainability practices;
- since 2015, FEUP has a dedicated structure on the sustainability topic – the Sustainability Committee with the mission of contributing to a better society, by incorporating the sustainable development principles in FEUP's decision processes, reflected in its core activities;
- FEUP has actively promoted and signed the commitment charter to sustainable development under the scope of the Sustainable Campus Network Portugal;
- it is a member of both the Portuguese Pact Plastics and the Portuguese Climate Pact.

In addition to these examples, it is important to emphasize that ESD is one of the strategic goals of FEUP. Consequently, in 2022, the EDS@FEUP project was launched, promoted by the FEUP's Executive Board, to equip students with the skills to include into their practices and actions, measures based on the sustainability pillars. The project encompasses the following actions: i) training of faculty and non-academic staff in sustainability; ii) integration of ESD in selected courses; iii) production of dedicated contents; iv) implementation of non-formal education initiatives; and iv) communication. Within the scope of this project, three continuing education courses have already been created and sustainability topics have also been integrated into certain curricular units of bachelor and master programmes. Con-

sequently, by the end of the current academic year (2023/24), the project is expected to impact about 3,500 students.

For the success of the ESD, it is essential to foster a culture of sustainability within the institution, as it is hugely relevant to put into practice what is learned in the classroom ('practising what it preaches') (Sonetti et al. 2019). Numerous initiatives, particularly awareness campaigns, are conducted for this purpose, many in partnership with student unions and groups. One of the most successful initiatives is the «More Sustainable Ideas» competition, held annually, which intends to stimulate the creativity of the FEUP's community towards a sustainable campus. The winning idea is awarded with the title of Most Sustainable Idea of the Year being promoted its implementation. Moreover, awareness campaigns related to responsible resources consumption, sustainable mobility, waste management, circular economy and gender equality are also undertaken.

In campus operations, best practices include measures related to energy efficiency, renewable energy (e.g. electricity generation from photovoltaic panels for self-consumption), waste management (e.g. waste reduction and increased separation rates), among others.

It is also worth noting the role of the research conducted at FEUP in various fields contributing to Sustainable Development Goals, such as renewable energy, sustainable urban planning, environmental assessment, mobility, waste recovery, water management and water/wastewater treatment.

The presentation is intended to provide detailed insights of the successful best practices implemented at FEUP, as well as their impact on SDGs, expecting that it can serve as an inspiration for other HEIs.

Keywords

Higher education, Sustainability, Education for sustainable development, Engineering, Sustainable development goals

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88 | Sustainable inclusion of youths from prison contexts through cultural heritage: the pedagogical action of the Puteoli Sacra Project

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Abstract

In Italy, minors and young adults (aged 14-25) currently under the care of the Juvenile Justice Services number around 14,000 (Cf. DGMC, 2024). We are clearly facing an educational emergency, which deeply challenges the pedagogical action and its transformative possibilities. Goal 4 of the 2030 Agenda, "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (UN, 2015), emphasizes the essential contribution of sustainable development to the social inclusion of marginalized and excluded adults and youth, through the full realization of individual life projects and democratic participation. In this sense, cultural heritage and heritage education represent a privileged ground to pursue the objectives of "sustainability."

The contribution discusses the pedagogical action carried out within the "Puteoli Sacra" project, aimed at boys and girls from the Juvenile Penitentiary Institute of Nisida and the Female Prison of Pozzuoli, respectively. The Puteoli Sacra Project, through the valorization of the cultural and historical heritage of the "Rione Terra", aims to promote a dual rebirth: on one hand, the enhancement of places and territory, and on the other, the personal and professional transformative potential of the participants.

For years, museums, considered as the primary depositories and responsible for heritage education, have been actively engaged in addressing the social issues of individual and community well-being and health (Sandell & Nightingale, 2012; Janes & Sandell, 2019). Specifically, the imaginative capacity is identified as fundamental for transformative and quality education, benefiting individuals, communities, and the environment, an education that allows looking to the future and initiating planetary change, in other words, a "sustainable" education (UNESCO, 2023)

From a pedagogical point of view, the project promotes the idea of education as a "practice of freedom" (Freire, 1979; Don Milani 1969), overcoming the concept of "re-education" associated with education in penal contexts, understood as educating anew and more rigorously (Iori, 2015), educating "from scratch" and "in place" of those families who have not been capable of doing so. Re-educating, like rehabilitating, implies that a consistently performed exercise can lead subjects to "function well", to overcome their social "disability".(Farne, 2020) However, such a perspective does not seem to fully account for the complexity of the change these boys and girls are called upon: the education of those who have turned to delinquency requires, in the first instance, the individual's willingness to participate actively and consciously in their personal growth, requiring that "search for an authentic life" (Bertolini & Caronia, 2021), which is driven by an emancipatory and self-determined transformative urge.

While acknowledging the coexistence of multiple determinants that influence the behavior of these youths, it is essential to place at the center of the educational journey the recognition of their capacity and possibility to be active subjects; this "agentic" capacity (Bandura 1997, Biesta G.J.J., Tedder M. 2007; Emirbayer M., Mische A. 1998; Sibilio & Aiello 2018), founded on self-reflective (Mezirow, 2000; Schon, 1993, Fabbri, 2007) and self-regulatory systems (Bandura, 1997), ensures each individual maintains a margin of freedom (Sabatano, Pagano 2019) in their decision-making processes, allowing them not to be deterministically connected to a family destiny that makes them the exclusive product of the criminal social system and structure within which they live.

In this perspective, the "Puteoli Sacra" project serves as a crossroads between social inclusion, sustainability, accessibility, and ecological care, as it invokes in a transformative key (Mezirow & Taylor,

2009) the pedagogical categories of beauty, active and democratic participation, and the common good. Specifically, after a training course, the boys and girls are engaged in the archaeological and museum site of Rione Terra as tour guides, responsible for educational activities for the school communities visiting the site, and in security and heritage conservation roles. In this sense, education and training, as primary agents of change towards sustainability (UN, 2015), promote self-understanding and understanding of others, as well as awareness of connections with the social and natural environment; “stimulating the values, behaviors, and lifestyles required for a sustainable future” (Falchetti, 2020, p. 139; Tilbury & Wortman, 2004); they call for a commitment to justice, responsibility, and dialogue.

Therefore, the "Puteoli Sacra" project can be seen as a "best practice" whose methodological, project-based, and value elements can be subject to replication in similar contexts, highlighting how, from an inclusive perspective, cultural heritage can contribute to strengthening the ability of at-risk youths to realize an autonomous life project, increasing their capacity to turn their aspirations into reality.

Keywords

social inclusion; sustainability; cultural heritage; transformative learning; juvenile delinquency.

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93 | The mediating role of plants. Living subjects to transform pedagogies, curricula, institutions

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Abstract

Despite the urgent need to see the interdependence between humans and the planet through the lens of sustainability, a dualistic view of this relationship is still rooted in our society. Vogel and O'Brien (2022) pose a challenge to the world: «Can we rapidly transform our societies and create a just, inclusive, and sustainable world?» (p. 653). Education, by its constitutive nature, has transformative purposes and is, therefore, the central discipline for any change. Pedagogical research can thus contribute to re-connecting with the more-than-human by developing novel curricula and educational environments that aim to overcome this dualism (Duraiappah et al., 2022; Misiszek, 2021; Weyland, 2022). The research community is aware that the process of reconnection itself requires an interconnection between different epistemologies, theories, and methods. As a result, the study is based on an interdisciplinary framework that brings pedagogy-didactics into dialogue with psychology, geography, architecture, and critical plant studies. The inclusion of the latter is based on the decision to limit the field of the non-human to the plant world. This is both for operational reasons and to revalue plants, historically considered at the bottom of the evolutionary hierarchical order, and to propose an educational approach aimed at overcoming the plant-awareness-disparity (Parsley, 2020). While geography and biology studies highlight how plants have been treated as objects and are understudied (Gagliano, Ryan & Viera, 2017), psychological studies highlight the relevance of nature-based interventions - activities aimed at modifying the living environment and changing people's behavior (Shanahan D., et al., 2019).

One way to promote teaching practices rooted in the concept of sustainability may therefore be to transform spaces and curricula by rewilding them (UNESCO, 2021, p. 66) through a relationship with an active subject, plants. This could be an effective way both to reconnect with these invisible world and to fill gaps in research on the effects of active interaction with plants (Van de Bogerd et al., 2020) in terms of learning and human and plant well-being. This requires a whole-institution approach (Mathie & Wals, 2022), which involves rethinking all dimensions of a higher education institution to green education and the academy (Fassbinder, 2012).

The paper presents the results of a doctoral study, aimed at establish relationships between pre-service teachers and plants by designing a curriculum for initial teacher education (ITE) that fosters their GreenComp (GC). The concept of educational environments, operationalized as a physical, relational, and activity space, informs the creation of three university classrooms with plants needed to further develop the curriculum. The research builds on the theory of transformative learning, draws from recent studies on ITE (Bamber, 2020), and is oriented by the following questions:

How is it possible to foster the development of GC in pre-service teachers by setting up educational environments with plants and formulating an interdisciplinary co-constructed green curriculum (IGCC)?

1. How does the presence of plants in tertiary education contexts affect the well-being and place attachment of professors and students?

2. How can a model of IGCC for higher education focused on the relationship between humans-plant world be developed participatively?
3. How can academic teaching spaces and activities with plants facilitate the development of GC in ITE students?

The research relies on a dialectical perspective that places the constructivist and ecological-pragmatist paradigms into dialogue. The design and methodology align with the state of the art on curriculum development and EfS in tertiary education (Leal Filho, 2018): the case study is multiple, vertical, and descriptive as it consists of two lines of work conducted through a parallel mixed-method approach. ITE students, their professors – who co-constructed the teaching and research materials – the environment with plants, and other members from two Universities, participate in the study. Teaching activities sought to activate the body-soul-intellect of all the participants, including plants, using multiple forms of expression. Qualitative data – collected through participant observations, narrative interviews, created materials, and focus groups – are examined through the documentary method and triangulated with the quantitative analyses of the pre-post questionnaires on GreenComp, and on wellbeing and place attachment.

At the heart of the research is the implementation of the IGCC, which supports the systematic development of the GC by focusing on the human-plant relationship and the exploration of an innovative approach for their acquisition: a plant-based approach in which plants influence curricula and spaces by becoming pedagogical subjects. Thus, the output of the project is a tool to support the creation of these interspecies educational environments: a geographical map to narrate the process aimed at generating similar processes in diverse contexts.

Keywords

human-plants curricula; interspecies educational environments; initial teacher education

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96 | Taming the wicked, simplifying the complex: asset-based community development in higher education for sustainable change

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Abstract

In grappling with complex issues, we find ourselves constantly probing for the root of the problem, seeking to unearth both causes and solutions. Yet, we cannot remain firmly rooted to the ground, nor continue to plant roots without evidence of success (Woolcock, 2017). As wicked problems persist, their solutions eluding the confines of right or wrong (Rittel & Webber, 1973), we are compelled to seek strategies grounded in good practices (Bentley & Toth, 2020) that help us “embrace complexity or to at least engage with it” (Bakker, 2016, p. 5). The path forward is to be sought in grassroots efforts, where solutions take root and flourish amidst the inherent characteristics of a *volatile, unstructured, complex, and ambiguous* (VUCA) world (Johansen & Euchner, 2015). Indeed, in 2019, António Guterres, the Secretary-General of the United Nations, issued a call to action across various sectors, heralding a decade of concerted efforts - globally, locally, and collectively - essential for advancing towards the 2030 Agenda objectives, urging communities to be the agents of an unstoppable movement that would yield the necessary transformations.

While history provides inspiring instances of successful community engagement to bring about sustainable change, the current convergence of crises, posing existential threats to humanity itself (UN, 2022), reveals a glaring absence of the mobilisation and cultural shift necessary for communities, including in higher education (Ramaley, 2014), to embrace these responsibilities. Moreover, even in the presence of willingness to act, there appears to be a deficiency in the skills necessary at different levels to implement such a transformation. Sustaining this position are recent international policies on competency development for current and future generations that have shifted their attention towards the identification of transformative (OECD, 2019) and global competencies (OECD, 2018), among others, that are apt to empower individuals not only to construct and critically reflect on their perspectives but also to actively shape and contribute to the continual improvement of an ever-evolving world through individual and community agency.

Higher education institutions play a crucial role in nurturing such competencies not only among students but also among faculty, staff, and the broader community. Indeed, Boyer's (1990) model emphasised the significance of scholarship that extended beyond mere discovery. He delineated three other key categories: integration, application (later termed engagement), and teaching and learning. These four categories of scholarship are interconnected, dynamically blending various forms of work necessary to enhance the quality of the academic experience. Key values underpinning this approach include a strong sense of ownership, motivation, mutual support, mentorship, and fostering both self-directed and collective transformative learning processes for individual and group development, as well as meaning-making endeavours.

This paper explores the concept of strengths-based community development and its potential to address the multifaceted challenges of sustainability. The theoretical reflections sustaining such approach have gradually brought together various schools of thought and disciplines spanning from economics, education, psychology, and health sciences to studies in organisational development and management. By leveraging the existing strengths and resources within communities, this approach seeks to shift the focus from problem-centric to asset-centric solutions, thereby fostering resilience and self-sufficiency (Kretzmann & McKnight, 1993; Cooperrider & Srivastva, 1987). In a similar manner, we argue that integrating asset-based approaches in curricula, research, and community engagement initiatives, higher

education institutions can support empowerment processes amongst students, faculty and staff to become agents of positive change in their communities through action-oriented learning.

To this end, in this paper we aim to outline the theoretical foundations and practical applications of the effectiveness of this change in perspective, from deficit-based to asset-based, on taming wicked problems. Secondly, we intend to outline how strategies from different disciplines and professions are essential components to integrate knowledge and skills to address sustainability challenges (OECD, 2018). As with asset-based community development, interprofessional and interdisciplinary education offer a valuable framework for collaborative problem-solving and proactive engagement, whether through personal lifestyle adjustments, advocacy efforts, or involvement in sustainability initiatives. By adopting a systematic approach that acknowledges the interdependence of environmental, social and economic factors, HEIs can foster authentic learning and meaningful engagement at grassroots level as they stimulate the creation of bridges and the broadening of horizons beyond organisational boundaries to engage with wider communities. Practical strategies explored include mentorship, interdisciplinary curriculum design, developing intercultural competence through study, work and social opportunities, and promoting community engagement within and outside HEIs.

Keywords

asset-based approaches; community development; sustainability; interprofessional education, interdisciplinary collaboration

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97 | Transdisciplinary sustainability education through the lenses of an ethics of care

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Abstract

Global sustainability challenges demand a radical transformation of our higher education systems. Scholars that try to “do things differently” often resort to transdisciplinary teaching practices to experiment with new ways of producing knowledge, as well as to foster values such as connection, reciprocity, and mutual care. Collaborative and care-oriented practices are seen as a way to combine academic excellence with collective and personal thriving.

This study emerges from the backdrop of the COVID-19 pandemic, a period that made evident the fragilities and contradictions of a neoliberal-dominated academic system. During that time, as a group of seven scholars working in different Universities across Europe, we came together to reflect upon our teaching and engagement practices – and the academic paradigms that support them – through a care ethics lens.

As a result of a three-years co-creation process, we developed an analytical framework, inspired by the care ethics literature, as well as other feminist contributions. The aim of the framework is to invigorate educators with a reflexivity tool that questions their pedagogical and institutional practices, unveiling the tensions, nuances, and complexities that characterize transdisciplinary and care-inspired teaching. The framework is rooted in the foundational theories of care as outlined by Joan Tronto, subsequently refined by Moriggi et al. (2020), while also drawing upon critical examinations of care ethics by feminist scholars. This theoretical scaffold is complemented by our empirical findings, using an auto-ethnographic approach. Findings refer to different educational activities, such as course design, coordination, teaching, supervision, tutoring, etc. Additionally, our analysis extends to research-driven participatory engagements and the orchestration of events to foster formative interactions and network-weaving among peers straddling the academic-practitioner divide.

Through the lens of this care-inspired analytical framework, we offer a critical vocabulary and a conceptual toolkit for the higher education community to engage in reflective dialogues around the often-sensitive nexus of care, sustainability, and educational practices. Our findings, rooted in the empirical exploration of our practices, seek to amplify the voices and validate the experiences of those committed to «doing things differently.» By critically scrutinizing the enactment of transdisciplinarity under various conditions, our study highlights the existing and potential challenges, proposing avenues for systemic interventions within the academic ecosystem.

Our investigation brings to the fore the indispensable role of care in reimagining the trajectories of higher education towards sustainability. It demonstrates that the integration of care principles into the fabric of higher educational practices—ranging from curriculum development and pedagogical strategies to leadership and governance—can serve as a powerful catalyst for nurturing environments that are not only academically enriching but also socially and environmentally responsible. At the same time, it takes a critical stance on caring, avoiding a normative, prescriptive approach, and unveiling also the dark sides of care.

Furthermore, this paper contributes to the broader discourse on sustainability in higher education by providing a scaffold for understanding how care, as a philosophical and practical ethos, can underpin

the efforts towards a more sustainable and equitable academic future. We advocate for a systemic re-conceptualization of academic values and practices, emphasising the need to shift from individualistic to collective, from competitive to collaborative, and from extractive to regenerative models within higher education.

Keywords

transdisciplinarity; care ethics; regenerative sustainability; analytical framework

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Moriggi, A. (2020). Exploring enabling resources for place-based social entrepreneurship: a participatory study of Green Care practices in Finland. *Sustainability Science*, 15(2), 437-453.

98 | What Defines Success in Developing Sustainability Competences? A Systematic Review

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Abstract

The dynamic landscape of higher education has increasingly emphasised the development of sustainability competences among students in response to address global sustainability challenges, resulting in significant institutional momentum in the sustainability field in recent years. This study aims to conduct a systematic review with the objective of examining competence-based programs at the higher education level for the development of key sustainability competences, as well as the pedagogical approaches employed by higher education institutions. In alignment with our research aim, a systematic search based on PRISMA guidelines, was conducted using scientific databases of Scopus, targeting empirical articles, and employing sustainability competences, higher education institution, and pedagogical approaches as primary keywords. Following the inclusion and exclusion criteria, the search yield empirical studies focusing on the development of sustainability competences in higher education institutions. The results provide two dimensions of sustainability competences development: a shift in teaching and learning from single, isolated disciplines to collaborative efforts within higher education institutions, and innovative pedagogical approaches rooted in the learning by doing.

1. Introduction

The discourse on sustainability competences (SCs) and its development has garnered attention in the last two decades, with a substantial body of literature exploring and addressing it. In the broader educational context Crick (2008) defines competences as “complex combination(s) of knowledge, skills, understanding, values, attitudes and desire which lead to effective, embodied human action in the world”. Despite facing criticism (Chappell et al., 1999; Trede et al., 2013), key competences provide a clear and accepted framework for defining distinctive profiles across academia, schools, graduates, professions, and beyond. There is a consensus on the key set of competences for sustainability (Brundiens et al., 2021), comprising system thinking, futures thinking, values thinking, strategic thinking, and interpersonal competences (Wiek et al., 2011; Wiek & Lang, 2016).

Hundreds of sustainability programmes have emerged at Higher Education Institutions (HEIs) around the world over the past two decades (Kahle et al., 2018). These educational initiatives, centered on competence development, facilitate learners in acquiring sustainability skills grounded in knowledge and attitudes, thus fostering responsible engagement and instigating a readiness to initiate or advocate for action across local, national, and global domains. However, the central inquiry for students, educators, programme developers, and policymakers revolves around the competences these programmes instill in students and their alignment with the “consensus competence framework” (Redman & Wiek, 2021) in addition to “complete, holistic, and systemic sustainability education” (Lozano et al., 2022). Hence, this systematic review is examining key SCs, pedagogical approaches and competence based educational programmes within HEIs for fostering SCs and elucidating their operational definitions of success.

2. Literature Review

2.1 Sustainability Competences

Sustainability, often seen as a modern concept, has evolved over time, traditionally linked to enduring without depleting resources (Mensah, 2019). Initially, sustainability encompassed three dimensions: environmental, economic, and social (James, 2014). Recent expansions include culture, technological economics, and politics. This evolution aligns with the shift towards competence-based education, focusing on enabling individuals to engage in diverse contexts and drive structural change (Rieckmann, 2012). Wiek & Lang (2016) define competence as a complex of knowledge, skills, and attitudes for effective task performance and problem-solving. SCs are “interlinked sets of knowledge, skills, attitudes, and values for effective action on real-world sustainability problems” (Redman & Wiek, 2011; UNESCO, 2007).

2.2. Pedagogical Approaches for Developing SCs

HEIs are crucial in developing SCs and shaping future societal leaders capable of addressing sustainability challenges through integrated curricula, education, research, and outreach (Martínez Casanovas et al., 2022). Lozano et al., (2022) note that there has been limited research on the relationship between pedagogical approaches in higher education and the development of SCs. According to Lozano et al., (2017) to integrate sustainability in higher education, it is essential to rethink didactical arrangements, encouraging new teaching methods and reshaping relationships. Key shifts include moving from consumptive to discovery learning (Thompson, 2016), teacher-centred to learner-centred (Herranen et al., 2018), individual to collaborative learning (Didham & Ofei-Manu, 2015), theory-dominated to praxis-oriented (Kanyimba et al., 2014), content-oriented to self-regulative (Vakaliuk et al., 2020), and purely cognitive to affective and skill-related goals (Thomas, 2018).

3. Methods

This study conducted a systematic literature using the recommendation of Moher et al., (2010) the preferred reporting items for systematic review and meta-analysis protocols (PRISMA) protocol and synthesised selected articles that were relevant key SCs development and pedagogical approach adopted by HEIs. The PRISMA checklist is used to guide researchers by providing the necessary information for conducting a rigorous review and assessing the quality of the outcome. PRISMA also emphasizes the importance of reporting and utilising randomized trials, which can be crucial for systematic reviews in various research fields (Moher et al., 2010).

4. Results

One important element to increase the effectiveness of HEIs in achieving SDG and developing SCs is to provide real-world learning through project, collaboration of public institutions, universities, enterprises, and other stakeholders, offering internship program, creating technological and science parks. The other important element that has been explored in this study are the exemplary pedagogical practices that are significant and successfully cultivate SCs. The importance of scenarios, student voice and freedom, and ownership of their learning is emphasized through multiple pedagogical approaches that explore current topics relevant to the SDGs. Pedagogical approaches rooted in real-world problems, such as PBL, CL, RL, FCP, GBL, are significant and add value to the development of SCs, in addition to student-centred pedagogies. The SCs developed by HEIs are consistent with previous competence frameworks (Rieckmann, 2012; Wiek et al., 2011) and emphasize the role of HEIs in addressing barriers to implementing the agenda 2030 (Veiga Ávila et al., 2019). Furthermore, the study highlights innovative pedagogical methods based on “learning by doing” (Brundiars et al., 2021).

Keywords

Sustainability Competences; Pedagogical Approaches; Higher Education Institutions; Competence based Education

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99 | Higher education and the post-pandemic scenario: a research project at University of Salerno to foster inclusion and sustainability within teaching-learning process

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Abstract

With the outbreak of the COVID-19 pandemic, higher education experienced a paradigm shift from the traditional university system to new forms of teaching and learning; this transition implied several challenges in terms of redefinition and reorganization of contents, approaches, tools, strategies, contexts and relationships in the process of didactic transposition (Chevallard, 1985) but it also showed innovative educational perspectives and important implications for sustainability (Mishra & Dholakia, 2023).

As a result, this changing scenario brought to light new training needs and innovative perspectives in teaching methods aimed at supporting all students, with particular attention to students with disabilities and / or specific learning difficulties.

In particular, the experience of remote teaching at universities during the pandemic has stimulated unusual methods of teacher-student-environment interaction drawing the attention on the opportunities offered by the «synchronous» teaching which represented the preferential method used by lots of universities to guarantee the «presence» of students through interaction; this choice allowed to preserve the participation which is a key factor for promoting inclusive processes (Ainscow, 2020).

The concept of «presence» refers to the relationship between «reality» and «virtuality» (Riva et al, 2009) which is linked to the level of interaction of the subject within the virtual environment. Furthermore, the sense of presence is at the basis of the recent studies on web 3.0 that highlight the possible creation of an «embodied internet» (Shin, 2022).

In light of these considerations, a reflection on possible future scenarios of university teaching is necessary for the adoption of innovative methodological approaches able to promote a systemic and sustainable change through ecological faculty development processes.

In this sense, hybrid and blended learning, which implies the mixing of distance and face-to-face learning, seems to be the option that most universities are choosing today, thus contributing to a post-pandemic university education which is increasingly digital and sustainable (Kanetaki et al., 2022).

The concept of sustainability, within this perspective, refers to the way higher education institutions work and manage their activities by redesigning curricula and delivering learning taking into account also the implications for the environment and the society (Stephens et al., 2008).

Such a scenario implies the need of developing a new and broader set of competencies for teachers and students, by focusing not only on the acquisition of digital competencies but also, and especially, on pedagogical competencies aimed at promoting higher levels of participation and inclusion by providing different kinds of teacher-student-environment interactions (Aiello et al., 2023).

In this context, the work presented here takes place at the Department of Humanities, Philosophy and Education, University of Salerno (Italy), where a research project aimed at envisaging new blended forms of interaction in teaching-learning process has been implemented.

The research aims to analyze limits and opportunities of distance university teaching in relation to the specificities of the Department of Humanities, Philosophy and Education through an approach that integrates different points of view (teachers and students), different approaches (qualitative and quantitative) and different research methods (traditional and digital). The main objective is to provide useful information for a planning and reorganization of the teaching-learning activities of the Department

based on a real awareness of the benefits and risks of digitalization in the creation of integrated and inclusive learning environments.

The project proposes a methodological framework aimed at identifying the needs, limits, inclusiveness and opportunities of synchronous teaching especially with reference to the relationship between body, space and presence and the methods for stimulating interaction and participation in the absence of physical space and through a technological artefact. The research protocol implies the analysis of secondary and primary data collected on different units of analysis and with different techniques. The information will be detected through mixed methods, integrated approaches that combine qualitative and quantitative procedures.

The research project is divided into two main phases.

The first phase of the research involves the implementation, in the second semester of the 2023/2024 academic year of an exploratory study aimed at detecting the opinions of students and teachers regarding distance learning to highlight its limits and opportunities through:

- the administration of a questionnaire to students enrolled at the Department in master's degrees as they have certainly experienced distance learning during their previous three-year degree;
- the conduction of focus groups with the teachers of the Department.

The second phase involves the experimentation, starting from the 2024/2025 academic year, of a set of blended teaching-learning activities within some master's degree courses.

Keywords

Higher education; inclusion; sustainability

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103 | Transforming into Sustainable Scholar-Practitioner Leaders

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Abstract

Mathie and Wals' (2022) report about exemplary whole-school approaches to sustainability around the world focuses on the dimensions of the institution that support effective practice. Organizations in all sectors that are committed to educating for sustainability require leaders who “can read and predict through complexity, think through complex problems, engage groups in dynamic adaptive organisational change and have the emotional intelligence to adaptively engage with their own emotions associated with complex problem solving” (Metcalf & Benn, 2013, p. 369). How are these leaders prepared? What are these leaders like?

For one example, our Doctoral Program in Organizational Leadership (DOL) at a small United States college in the Washington DC area, has supported the development of scholar-practitioner leaders through its mindful, sustainable program design. The program was planned to prepare leaders who serve and transform in their organizations and communities. The dimension of the whole-institution approach (WIA) this proposal addresses is the first: Vision, ethos, leadership, and coordination. Our program and this research study “includes learner voice and participation” as the first dimension specifies. As each new group of doctoral students begins our program, and as the program has evolved into what we initially aspired for, we are struck by the powerful accomplishments, mindsets, and actions of our students and graduates. As leaders and as scholar-practitioners, they have embraced the ethos of what it means to reflect on their values, collaborate in problem-solving, and utilize a systematic approach to analyze data which can inform and drive decision-making (Filho, et al., 2018).

In this phenomenology (Moran, 2002), we aimed to understand the lived experiences of doctoral students embarking on a learning journey toward becoming scholar-practitioners. We explored their perceptions of the doctoral program ethos as well as what goals they had for themselves as scholar-practitioner leaders. We collaborated in this research project to survey students and graduates and engage in a series of in-depth interviews. Do the students and graduates of the program use the tenets and skills of research to understand, analyze, and apply to their personal and professional leadership practices? How do their perceptions of themselves as leaders change and what elements of the program do they believe influenced their changes? Do they have the tools needed to understand, consume, and carry out research in their communities? Is the phenomenon of their leadership development due mainly to the type of individual who is drawn to the program and whom the program chooses? What aspects of their approach are mindful? What aspects are shaped by the design and components of the program? Do the relationships with other leaders in their cohort and instructors in the program play a part in their development? We sought to understand if the program's ethos influenced the values and goals they sought as leaders. To understand such an allusive, subtle, and complex phenomenon as individuals' self-reflections on their leadership development, we posed questions, gathered findings, and explored commonalities and patterns in the participants' self-assessments.

We employed a phenomenological approach rooted in Van Manen's (1990) characterization, “Phenomenology aims at gaining a deeper understanding of the nature or meaning of our everyday experiences. Phenomenology asks, ‘What is this or that kind of experience like?’ It differs from almost every other science in that it attempts to gain insightful descriptions of the way we experience the world pre-reflectively, without taxonomizing, classifying or abstracting it.” We conducted a series of 2 semi-structured interviews with 21 doctoral candidates and alumni. Our data sources included interview

responses, an ethos and goals ranking activity, two self-anchoring scales (Kilpatrick, & Cantril, 1960)—one on ideal leaders and one on ideal scholar-practitioners, researcher journal (Richards & Hemphill, 2018), and a multi-item survey consisting of Likert questions, open-ended prompts, and listing activities.

Our qualitative research was framed by 3 purposes which informed these research questions:

Purposes	Research Questions	
to explore leaders' journeys of becoming scholar-practitioners and the influence that has had on their leadership	How do DOL study participants believe the program influences them to be leaders?	What do they believe influences their growth as scholar-practitioner leaders?
to discern the leadership profile the Hood DOL program attracts and selects	What leadership qualities and characteristics do the DOL study participants see in themselves and their fellow students?	
to identify and understand the DOL program ethos and milestones that support the doctoral journey	What are the milestones participants identify that support them in their doctoral journeys?	In what ways, if any, do they perceive the ethos of the DOL program as influencing their development as scholar-practitioner leaders?

The purpose of our paper session will be to present the findings from our study to share the themes, implications, and recommendations stemming from what our participants shared.

Keywords

scholar-practitioner; leader; ethos, transformation

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104 | Teaching Sustainability with Care

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Abstract

In this paper presentation, I report my classroom teaching and learning practices over the last three years, within a framework of curricular sustainability, guided by the UN sustainable development goals. My courses are core parts of an undergraduate, interdisciplinary Health Studies Program at the University of Saskatchewan, Canada, and my teaching is accompanied by extensive student surveys and feedback that is part of this presentation.

Recent scholarship has noted that “the five-alarm nature of climate chaos requires revising curriculum, research, and innovation throughout higher education” (Crow and Dabar, cited in Orr, 2023, p.11). But how can we address the “polycrises” that we now find ourselves in - while creating a supportive atmosphere for our students that does not deny the crises? After all, recent surveys of young people have shown a decline in mental health. A study by Caroline Hickman and colleagues on climate anxiety, undertaken with 10,000 children and young people, showed that 59% of the respondents were very or extremely worried (Lancet 2021). As instructors, we may also be affected by anxieties elicited by the polycrises and may need to reflect on our own moral anguish and guilt (Solnit, 2023; Schultz, 2023), or on our grief about the loss of biodiversity, and if it is appropriate to include our own reactions, and in what ways, in the classroom. We also need to consider potentially humanocentric language that suggests to leave the world in a sustainable state for humans who come after us (but what about all other life forms?). Perhaps, we may want to choose terms like the “planetary” - a term that refers to a general habitability for life and not only to life in human form (Chakrabarty, 2023). Even more critical are Maynard and Betasamosake Simpson (and others) who note that the climate catastrophe was born not from an inclusive mankind but from the slave plantation, the settler town, the prison, the reservation, following Europe’s Industrial Revolution (2022, p, 132). Obviously, matters of sustainability pose a “wicked problem” (Chakrabarty, 2023).

It would be pretty much impossible to include the many issues of sustainability into any single course. I had to find some form of a broad, flexible, kernel from which to approach the “polycrises” in selected ways that could also apply to other issues of sustainability not covered in class. First, philosopher Hannah Arendt’s concept of natality, that is, new beginnings, invests humans with the freedom to begin anew every day, not alone but in community with others (1998). Arendt’s call to action is my personal antidote against despair. Second, I now begin all my courses with a vignette from Indigenous plant scientist Robin Wall Kimmerer’s book “Braiding Sweetgrass” (2020). In one chapter, Kimmerer invites her students to reflect on their relationships with the lands and plants around them. Many students profess their love for the lands and plants. But then Kimmerer asks her students to consider whether the lands and plants might love them back, in a reciprocal way. I have tried this vignette in university EDI workshops and now in all my courses. At first, there may be consternation, often followed by exhilaration, and a tentative reorientation: while many profess concern for sustainability, they often consider it only from an instrumental, one-sided human perspective; the consideration of full reciprocity for one’s relationship with the world is often novel for people to consider. It opens up possibilities of reconsidering ways and relationships of doing research (e.g., decolonized research; research as [Indigenous] ceremony), relating with the environment, and relating with the diverse others in the classroom. Basically, Kimmerer’s kernel can be applied to all our relations regarding sustainability, or planetary health, research, and teaching and learning.

This kernel grounds my pedagogy. Instead of teaching theories of say, photovoice, focus groups, arts-

based learning, or survey questions, I invite the students to engage with the world around them, take photographs, or design arts-based reflections (like dialogue boxes or comic panels), or construct focus group questions, and bring their examples to class for «show and tell» in small work group discussions. Thereby, the students (generally from diverse personal and cultural backgrounds) learn practically, by experience, how photovoice analysis can be exciting, useful, and empowering. They share with each other reasons and backgrounds for taking the particular photographs, thereby getting to know each other more. Also, I invite speakers from different communities (often Indigenous) or universities, to speak on selected issues of sustainability and share their practices.

Class assessments are based in part on questions drawn from students' work group summaries; include self-directed learning assignments, say, with prompts that invite short reflections, or invite experiential body movements ("expression sessions", introduced initially by practitioners) so that teaching and learning is not only cognitive but also bodily and emotional. I have also devised "impression sessions" where students use an artistic medium of their choice (e.g., painting, sculpture, photography, collage, poetry, music) to depict some issue of sustainability. Another assignment consists of a standard research paper that also includes a personalized action plan. In the case of one of my students, this paper and action plan was phenomenally successful. The student took the sustainability strategies that she had explored in class into her large Sikh community. There, communal dinners with hundreds of participants are held several times a week. This student's sustainability strategies completely revamped her community, were featured in several university news articles, and the student presented her actions with me at international conferences. On another note, sustainability encompasses also matters of peace, justice, and governance (SDG 16) – including current conflicts in the world, leading me to consult with Indigenous colleagues how to address such divisive conflicts in class. In sum, Kimmerer's vignette on the reciprocity of relations provides a frame for me to address vision, curriculum, institutional practices, capacity building, and community connections.

At my own university, I am one of six "Faculty Sustainability Fellows" and we have been analyzing our teaching and learning experiences with our students through qualitative and quantitative surveys for our students, as well as our students' comments in their assignments in our courses. In my proposed presentation, I will illustrate examples from my teaching practices with my students' reflections and observations that may provide evidence for the effectiveness of the sustainability teaching practices in my courses. In particular, I will introduce in my conference presentation in Padua, as a practical example, the vignette by Kimmerer about the reciprocity of relations, inviting the audience to consider and discuss their own responses.

Keywords

sustainability; reflection; reciprocity; practice; action

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112 | Let's talk science! European scientists' commitment to sustainable science popularisation

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Abstract

Progressive climate change requires the development of appropriate strategies to achieve climate neutrality at different administrative levels and within different institutions. Due to its massive scale and high energy intensity, the overconsumption of single-use plastics (SUP) is taken as an example. Due to their continued popularity, exponential growth rates and skeptical forecasts regarding efficient disposal, they pose a major threat to the natural environment and public health. Although science communication (popularization) and integration (participation) are among the most effective methods to improve public perception and influence people's behavior, they remain superficial.

Here, we present a novel approach (combining a restructured circular economy setup with the quintuple helix model of innovation) that shows how knowledge brokerage initiated by scientists (stepping out of ivory tower universities) but carried out together with other non-academic stakeholders (e.g. SUP producers, recyclers, shopkeepers, restaurant owners, consumers) can increase its quality and trustworthiness. We also assess the potential impact on sustainable plastics and climate change mitigation efforts.

Our study uses a mixed-mode approach: a survey followed by a consecutive focus group, integrating both quantitative and qualitative data collection methods. In order to provide a representative model for a European setting, we gathered as respondents a group of academics from France, Germany, Italy and Poland – countries selected on the basis of different stages of sustainability transition – and other knowledge non-academic brokers. They all had a vibrant interest towards the threat posed by SUP. We wanted to identify respondents' attitudes, encouraging and discouraging factors, and perceived critical skills related to science popularization. The survey was emailed to 771 individuals, yielding a response rate of 11.8%. Subsequently, in order to assess a deeper perspective of the obtained quantitative results, a virtual focus group was organized via MS Teams.

Our findings show that respondents recognise the importance of science popularisation, even more so that they see science communication as their mission and duty in the light of the crucial factor of sustainable transition. The skills they possess, the audiences they select and, most importantly, the audiences they work with in communicating knowledge vary from country to country. Their outreach is very much shaped by the institutional, national and cultural context, career stage, gender, sex and discipline from which they come. In general, older, female and more social disciplines are more open to taking on popularisation tasks, understanding the need for a societal mission and ethical duty, especially in the context of the threat of plastics to the environment and health. They also believe that combining research knowledge with non-academic experience (linking government, science, industry, society and nature) is a key driver for achieving sustainability transitions through science communication between stakeholders of a circular economy for plastics.

This project has practical value in better understanding the impact of collaborative knowledge brokerage and dissemination in models of adaptation in the face of climate crisis, and also in demonstrating whether systemic changes towards mandatory outreach of the academy to the public will lead to an evolution in the acquisition of trust between scientists and the rest of society, ultimately bearing fruit in the reduction of single-use plastic consumption as one of the principles for achieving climate neutrality.

Keywords

Science Communication; Sustainability transition; Circular Economy; Quintuple Helix Model; Single-Use Plastics; Community connections

113 | Future teachers and whole institutional approach to sustainability

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Abstract

Safe and just operating space for humanity on a stable planet has its nine planetary boundaries, and they have been quantified (Rockstrom et al., 2009, 2014., Rockstrom and Klum 2015). We know planets tipping points, but societies are not changing. They still use „business as usual“ model of management and leadership. So, can and how education help societies to transform them self's? Can educational institutions reimagine education and our future (Lange, 2023)?

One of the main prerequisites is to educate future teachers in the field of sustainability. This is crucial for creating a more just and sustainable future. Initial education of future teachers in the field of sustainability is fundamental in order to empower them to effectively address global challenges such as climate change, biodiversity loss, resource depletion, social and economic inequalities, in educational settings. This contributes to building a generation of sustainability literate citizens who are capable of making informed decisions and taking action to protect people and the planet. Educating future teachers in sustainability is paramount to ensure that they can tackle «wicked problems» and effectively incorporate environmental, social, and economic dimensions of sustainability into their teaching. By providing them with the necessary knowledge, skills, and resources, we enable them to cultivate a sense of stewardship and sustainability consciousness among their students. Moreover, preparing teachers to integrate sustainability across various disciplines helps promote interdisciplinary learning and fosters critical thinking and problem-solving skills essential for addressing complex sustainability challenges so we can create a more resilient and sustainable society for us and generations to come. Pedagogical approaches that emphasize experiential learning, community engagement, and systems thinking are at the very heart of education for sustainably. These approaches empower teachers to facilitate meaningful learning experiences that inspire students to become active agents of positive change in their communities and beyond. By embedding (transformative) sustainability education into teacher training programs, we not only prepare educators to address current environmental and societal issues but also empower them to shape a more sustainable future through the transformative power of education.

However, to move beyond education for sustainability being just another an add on to the curriculum we need to develop models of leadership that will lead the change. One of does model is the Whole-institution Approach (WSA) that represents a comprehensive framework that encourages educational institutions to redefine their approach to education to meet societal challenges. The whole institution approach to sustainability integrates sustainability education throughout the institution, fostering opportunities for students to live and learn sustainability in various aspects of the educational environment. It aligns what students learn in the curriculum with the practices of the school/higher education institution in management, operations, and outreach, and extends learning beyond classrooms by involving students in decisions, community projects, and global initiatives, promoting real-life experiences and actions for sustainability through partnerships with community groups (EEA Strategic Framework, 2022). Based on the work of Wals and Mathie (2022) and Holst (2023) WIA approach has six interconnected aria: Vision, Ethos, Leadership & Coordination, Curriculum, Pedagogy & Learning, Community Links, Capacity Building and Institutional Practices (Wals and Mathie, 2022), or seven organizational areas of action: Governance, Curriculum and formal learning, Operations and campus

management, Community and networks, Research (in higher education), Human capacity building and Communication (Holst 2023).

Future teachers play a crucial role in implementing WIA, so this research aims to explore their attitudes and opinions regarding the whole-institution approach to sustainability. Or in other words its aim is to examine future teachers' understanding of the concept of the whole-institution approach to sustainability. It aim is to explore have their educational organizations integrated WIA to sustainability, and what do they perceive, is it desirable for educational organization to integrate WIA to sustainability? Final goal of the research is to identify barriers for successful integration of WSA in educational organization.

Instrument that is being developed originates from the recent work of Holst (2023) where he identified statements that describes facets of WIA within the organizational areas of action.

The convenient sample will consist of students enrolled in teacher education programs at higher education institutions in Croatia (min N=100). The aim is to include participants from different disciplines to ensure diversity of attitudes and perspectives. Data will be analysed using statistical procedures for data analyses.

Keywords

future teachers, sustainability, whole institution approach

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114 | The role of educational leadership to promote the culture for sustainability within educational institutions

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Abstract

The effects of unregulated economic and industrial progress have led the international community to reflect on the serious consequences caused at an environmental and social level such as: pollution and destruction of natural ecosystems, inequalities, the exhaustion of natural resources, economic crises and wars, global population growth. Therefore, in 2015, the need to face these increasingly complex challenges drove the international community to define an ambitious action program contained in the 2030 Agenda, whose 17 Sustainable Development Goals (SDGs) are shared by 193 Member States, precisely because the guarantee of sustainable development requires commitment and assumption of responsibility by all States and all organizations. Such a vision, however, requires reorienting the education of all nations to be able to develop knowledge, skills, perspectives, and values, to give all people of all ages the opportunity to take responsibility for creating and inhabiting a sustainable future (UNESCO, 2004).

Considering the role attributed to education, a decisive role for the development of successful education for sustainability must be given to educational leaders who can be key agents for the creation of school organizations for sustainability and for meaningful teaching and learning processes (Leithwood et al., 2004). An educational leader who wants to create an organization guided by the culture of sustainability has the responsibility to (a) support his teachers in developing the knowledge, skills and dispositions that the pedagogy for sustainability requires; (b) promote practices that can reflect the philosophy of/towards sustainability; (c) build the school as a social actor by promoting alliances with the community, to ensure the achievement of common objectives for a sustainable future (Kadji-Beltran et al., 2013). Creating a sustainable school requires rethinking school functioning in a holistic way, including the curriculum, teaching/learning processes, resource management and collaborative approaches both within and outside school boundaries. This means adopting a whole-school approach (Henderson & Tilbury 2004) to start a transformative journey capable of creating coherence between pedagogical, organizational, and social culture, physical spaces, the use and management of resources.

For an educational institution, the adoption of the whole-school approach model implies to make the effort to minimize the gap between the declared values and the practices implemented.

Therefore, the concept of sustainable school therefore coincides with a holistic approach to education for sustainable development (ESD), since its principles should be part of the ordinary transformative and improvement process of the school and not an optional or alternative perspective; it should concern the construction of learning environments and experiences useful for engaging students in practice, contributing to the construction of a more sustainable society and a better quality of life (Gough, 2005); it should present itself as a model of sustainable life, operationalizing democratic governance and an inclusive culture. This implies that leaders of educational institutions have to play the role of agents of change since they have a position that allows them to shape the organizational structure and build the conditions for the implementation of innovative planning and successful practices.

ESD requires the implementation of a holistic change in the organization guided by the adoption of a leadership style that orients and promotes transformation rather than adaptation, which looks to a sustainable future from an interdisciplinary perspective, based on an effective collaboration at the governance level. In this sense, transformative leadership becomes vital for the implementation of ESD, but

itself sustainability requires a change of leadership paradigm. This can be achieved in the implementation of those components identified by Hargreaves and Fink (2006) in the construction of shared actions, in the ability to share responsibilities, to promote learning, to collaborate and cooperate with others in the promotion of education for sustainability (EfS).

Therefore, the education for sustainability requires leadership that can create a vision of change and motivate people to participate in the implementation of sustainable processes (Scott, Tilbury, Sharp, & Deane, 2012), to negotiate change with various local agencies and the internal and external community, to create sustainable practices that truly respond to the needs of the reality.

Although in Italian schools there are initiatives and experiences in favor of sustainability education, there are no specific studies on the role of leadership for ESD in educational institutions. To fill this gap this study aims to respond to the following questions “What perceptions do the participating principals have of their leadership and of the actions implemented to promote sustainability education according to the 2030 Agenda’s values?”

To respond to the research question the northern Italian schools’ principals were invited to respond to an open question questionnaire that was *ad hoc* created. Data collected from the 51 participants showed that principals are aware of their role and leadership in promoting the development of sustainability mindset: they include goals and initiatives for sustainability in all the institutional documents, making more effort on those that are regulated by specific norms. However, much more effort needs to be done before considering EfS as a holistic approach that characterizes values, culture and practice of the whole educational community.

Keywords

educational leadership; sustainability mindset; education for sustainability; school.

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117 | Towards gender equality: more sustainable organizations through critical feminism

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Abstract

According to the 1987 World Commission on Environment and Development report (Brundtland report), sustainable development should «meet the needs of the present without compromising the ability of future generations to meet their own need» (p.43).

Therefore, sustainability requires an integrated approach to social, economic, and environmental aspects to address challenges of equity, economic development, and environmental protection (Franceschetti & Moini, 2023).

Sustainability is thus understood as the process of planning and managing social systems that promote overall well-being, with a particular focus on the ability of a social system to function at a defined level of social well-being indefinitely (Scattola, 2010). This includes the capacity to create and maintain a fair, just, and inclusive society, with access to fundamental rights such as education, health, decent employment, and sufficient income (Prospettive per una nuova teoria sociale della sostenibilità, 2021).

Leach and colleagues (2016) emphasize that attention should be placed not only across generations but also within them, giving importance to gender equality. Therefore, they adopt the following definition: «Sustainable development is development that ensures human well-being, ecological integrity, gender equality, and social justice, now and in the future» (Leach et al., 2016, p. 3).

The contribution focuses on the growing research on Diversity Management (DM) and its implications for gender equity and organizational sustainability, particularly in the Italian context. Although DM is recognized as a vital strategic choice for organizations globally (Olsen & Martins, 2012), its development in Italy primarily focuses on issues of female workforce (Colella & Di Lorenzo, 2023). In fact, despite being generally more educated than men, women face lower employment rates, which further narrow with an increasing number of children (Istat, 2020). Additionally, female workers tend to have lower incomes due to the precariousness of their employment contracts, gender imbalance in economic sectors, and limited opportunities to hold top positions (Guarascio et al., 2023).

Within the theoretical framework, critical feminism focuses on dismantling patriarchal organizational structures, emphasizing reflection on privilege, structural reform for emancipation, increased gender awareness, and solidarity reconstruction (Bierema et al., 2022). This feminist perspective adopts an intersectional approach, highlighting the interconnectedness of different dimensions of identity such as gender, race, class, and sexuality (Crenshaw, 1989; hooks, 1984). Through a critical analysis of social, political, and economic institutions, critical feminism seeks to identify and address entrenched gender inequalities within these structures (Collins, 1990; Mohanty, 1984). At the same time, social constructionism, rooted in claim-making and narrative analysis, underscores the contextual and interactive nature of social issues (Spector & Kitsuse, 1977; Tamboukou, 2008).

Previous studies highlight the need for a contextual understanding of DM approaches, questioning assumptions about their universal applicability (Ravazzani, 2016), and it is in this sense that the present research aims to contribute.

Methodologically, the study employs narrative inquiry (Esin et al., 2014), focusing on personal narratives to understand perceptions of gender equity in organizations in Vicenza. Fifteen semi-structured interviews with human resources managers and/or union representatives will explore policies and organizational practices that promote gender equity. Subsequently, three digital storytelling workshops

will be organized with staff from exemplary organizations to allow them to share their experiences in a structured storytelling process. The workshops will provide another layer of qualitative data through voice recording of the Story Circle and group projection phases, as well as a collection of texts from the digital stories created during these workshops. This effort aims to recognize, examine, and disseminate organizational models to improve gender equity practiced by manufacturing, cooperative, service, commercial, tourism, tertiary, and artisanal enterprises in Vicenza.

The research not only contributes to developing greater awareness and understanding of gender equity in Vicenza's organizations but also provides insights and tools to promote positive organizational change.

Keywords

social sustainability, critical feminism, organizational processes, gender equality, narrative inquiry.

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Abstract

“Organizing... is creating a coherent, unified, just structure by individuals, groups, organizations, and communities to fulfill goals.... a means of enacting people in the work of the enterprise, which is different from referring to the entity of an organization” (Bierema et al., 2024, p. 251). Yet, organizations can only develop as just, equitable workplaces when they are humanly sustainable. Organizations typically privilege economic and sometimes environmental sustainability and promote these efforts as heightening their level of social responsibility. Unfortunately, humans regularly get left out of the sustainability equation, and human sustainability is marginalized compared to money and the environment in many organizational cultures. Human resource development (HRD) professionals are uniquely positioned to advocate for human sustainability, but do they have the knowledge and ability to create structures supporting humanly sustainable organizations (HSO)? HSOs integrate sustainable practices into all aspects of policy, practice, leadership, and organization development. This paper introduces a theoretical model of humanly sustainable organizations with practical applications and implications. The model introduces a critical human resource development perspective, aligning workers’ goals with the organization’s goals, holding leaders accountable for humanly sustainable practices, and structuring organizations to conduct business smoothly, ethically, humanely, and sustainably.

Humanly Sustainable Organizations

Sustainability is behaving in ways that protect survival and welfare, sometimes described as pursuing health and wellbeing, environmental quality, and economic viability for present and future generations. Bierema (2020) defined it as “Humanly sustainable organizations and communities are places where the culture, climate, policies, and practices promote the wellbeing of people who thrive physically and mentally and actively contribute to the overall wellbeing of the world” (p. 356). Humanly sustainable organizations are evident in cultures that foster collaboration, value people, commit to diversity, equity, and inclusion, and offer workers a culture of support. Most people would appreciate working in a humanly sustainable culture, yet organizations are often toxic, competitive, unjust, and inequitable. When these unsavory characteristics permeate a culture, performance on all levels is harmed (Pfeffer, 2018). Human sustainability gets sidelined when organizations get greedy. Still, the World Health Organization advocated human sustainability as a smart, just practice (WHO, 2007).

Humanly Unsustainable Practices

Human resources (HR) “greening” is becoming more prevalent, and sustainability research is flourishing (de Stefano, Bagdadli, & Camuffo 2018). Yet, the integration of HR and corporate social responsibility (CSR) is meager (Fenwick & Bierema 2008), and HR greening tends to privilege environmental responsibility. People and communities are vulnerable to policies and practices that feed unfettered globalization and profitability sought by corporate interests.

Workplace toxicity hurts people. Work is the number one source of stress (American Stress Institute, n.d.) and the fifth cause of death in the United States (US). (Schwantes, n.d.). Approximately 33% of the world reported stress, worry, and pain in 2019, with one out of five reporting sadness or anger (Gallup 2019). Pfeffer (2018) conducted an extensive study of work-related vulnerabilities in his book, *Dying for a Paycheck*, where he identified ten workplace liabilities that hurt workers and sometimes result in their deaths: (1) unemployment, (2) lack of health insurance, (3) shiftwork, (4) long hours, (5) job insecurity, (6) family-work conflict, (7) lack of control/autonomy, (8) the pressure to produce,

(9) little social support, and (10) unfair treatment. These liabilities contribute to over 120,000 deaths per year and over 300 USD billion in costs to employers annually in the U.S. Unhealthy, toxic workplaces have created a health crisis.

The COVID-19 pandemic benefited workers who elected to quit rather than suffer in toxic work cultures. Taylor (2021) noted that job quitters left for organizations that aligned with their values, paid better, provided career pathways, and supported flexibility, including remote work. Limeade (2021) surveyed over 1,000 full-time workers who changed jobs. Reasons for quitting included: Burnout (40%), organization changes (34%), inflexibility (20%), insufficient benefits (19%), and poor support for well-being (16%). Respondents made changes for remote work (40%), better compensation (37%), stronger management (31%), organization reputation (29%), more life balance (26%), and flexibility (24%). Expectations remain high for remote, flexible work with more life balance and human sustainability. Organizations privileging cultures of belonging and engagement are attracting and retaining workers for their healthy organizing practices. Time will tell if workers' demands for saner, more humane workplaces influence leaders to change their toxic cultures.

Although toxic, unhealthy workplaces proliferate, their cultures neither improve profitability nor performance. Ninety-seven percent of companies recognize that wellbeing impacts business results. Yet, they ignore the extensive evidence that human sustainability is essential, with one out of three companies underperforming due to stress and anxiety, and half of the workers not regarding their organizations as doing enough to promote wellbeing (Gopinath & Mitra 2017).

Human Resource Development and Human Sustainability

Although human sustainability is laudable, organizations, particularly human resource development (HRD) practices, often fall short of aligning with sustainable development goals (Alfred et al., 2020). Despite HRD's shortcomings in promoting human sustainability, Jang and Ardichvili's (2020) study analyzing corporate social responsibility reports concluded that HRD is perceived as playing a key role in diversity, equity, and inclusion; performance management; business ethics and ethical culture; and raising awareness about CSR. Signs of organization health include managerial efficacy, amiable power relations, HRD orientation and practices, teamwork, organization values, innovativeness, and morale (Singh & Jha 2017), policies and practices HRD can influence.

HRD is in a position to promote organization health, yet, the topic receives scant attention. As Bierema (2020) advocated:

Humanly sustainable organizations and communities should be a right, not an anomaly. Perhaps one-day organizations will be held accountable for creating toxic work environments that contribute to the ill health of their workers the same way they are for polluting the environment and engaging in corrupt business practices. (pp. 356-357)

This paper will put forth a model of humanly sustainable organizations as a starting point for research and practice and create a structure and strategy for holding organizations accountable for human sustainability, health, and wellbeing.

Keywords

humanly sustainable organizations; human resource development; critical human resource development, wellbeing

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119 | Actioning Transformative Learning in Higher Education through Active Learning: Potentials and Pitfalls

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Abstract

Summary: This paper explores transformative learning as a strategy for embedding sustainability into educational practices. While current approaches often marginalize sustainability, the whole-institution approach (WIA) integrates pedagogy, curriculum, community connections, and leadership. Transformative learning, characterized by significant changes in perception and interaction, is essential for fostering sustainability. This study examines the potential and challenges of implementing transformative learning through active learning strategies, involving student participation and collaboration. Through a literature review and an analysis of expert interviews, the study aims to provide insights into effective practices and propose actionable recommendations for higher education institutions. The findings seek to advance the discourse on sustainable development in higher education and support long-term educational transformation.

Introduction

The global urgency for sustainable development necessitates profound pedagogical shifts within higher education. This paper addresses the need for educational strategies that not only inform but transform. Current educational approaches often marginalize sustainability in academic discourse and practice. As institutions deal with the complexities of integrating sustainability into their systems, the whole-institution approach (WIA) has been suggested as a method for promoting sustainability education. WIA involves multiple facets including pedagogy and learning, curriculum, community connections, capacity-building, institutional practices, vision, ethos, leadership, and coordination (Wals & Mathie, 2022). However, ensuring sustainability in higher education should not be limited to promoting sustainability education; it must also encompass *sustainability of education*—the long-term viability and effectiveness of educational systems and practices—by transforming curricular and pedagogical processes across all disciplines. The 2030 Agenda for Sustainable Development, for instance, views sustainability as a transversal and transdisciplinary framework and education remains central to achieving the agenda's goals. Transformative learning approaches are a viable strategy for promoting sustainable educational practices. Transformative learning refers to processes that lead to significant and irreversible changes in an individual's perception, conceptualization, and interaction with the world (Hoggan, 2016). While there has been increasing use of transformative learning approaches in teaching sustainability, their adoption for general curricular or pedagogical activities in higher education remains significantly limited. Also, fostering transformative learning in educational settings continues to be a concern among scholars (Baumgartner, 2019; Cranton, 2016). Major issues with the adoption of transformative learning approaches in higher education border on how transformative learning theory is not grounded enough for practical teaching-learning undertakings. This paper explores the potentials and pitfalls of fostering transformative learning in higher education, focusing on the "Pedagogy and Learning" dimension of the WIA. It argues that a major approach to facilitating transformative learning is the integration of active learning principles into higher education curricula. Active learning involves the use of various individual and collaborative strategies that encourage learners' physical and mental participation in instructional activities (Bonwell & Eison, 1991; Weimer, 2020). Thus, this study is guided by the question: How can active learning processes be optimized to promote transformative learning in higher education?