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Embedding sustainability in higher education: A review of institutional strategy, curriculum reform, and digital integration

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Abstract

As sustainability becomes a central concern in global policy, higher education institutions (HEIs) are increasingly expected to act as transformative agents in advancing the Sustainable Development Goals (SDGs). This narrative review synthesises recent literature to examine how sustainability is operationalised within HEIs through three interrelated dimensions: institutional strategy, curriculum reform, and digital transformation. The findings reveal that while many universities align their mission statements and policies with the 2030 Agenda, implementation is often hindered by structural fragmentation, limited governance frameworks, and lack of coordination. Education for Sustainable Development (ESD) emerges as a critical pedagogical model that shifts beyond environmental education, promoting systems thinking and participatory learning. However, ESD integration remains inconsistent due to disciplinary silos and outdated teaching methods. Digital transformation is identified as both an enabler and challenge, with technologies such as e-learning platforms and smart campus tools offering new avenues for sustainability education, while digital inequity and sparse research limit its full potential. This review contributes to both theory and practice by highlighting the need for cohesive institutional frameworks, interdisciplinary collaboration, and equitable access to digital infrastructure. It offers actionable insights for policymakers, academic leaders, and educators striving to embed sustainability more systematically within higher education. Future research is encouraged to explore student and faculty engagement, cross-disciplinary applications of ESD, and the long-term impact of digital strategies on sustainability learning outcomes.

Keywords: Sustainable Development Goals; Higher Education Institutions; Education for Sustainable Development; Curriculum Reform; Digital Transformation**.**

1. Introduction

Higher education institutions (HEIs) are acknowledged as pivotal entities in attaining sustainable development via education, research, community engagement, and administrative practices (Ketlhoilwe et al., 2020). The United Nations' 2030 Agenda designates education as pivotal for the progression of the Sustainable Development Goals (SDGs), advocating for local adaptation and institutional involvement (Ruiz-Mallén & Heras, 2020).

Education for Sustainable Development (ESD) is essential to this goal, providing a comprehensive strategy that incorporates social, economic, and environmental aspects (McKeown & Hopkins, 2007). In contrast to conventional environmental education, ESD encourages critical thinking and participatory learning to facilitate behavioural change and achieve lasting impact (Oe et al., 2022).

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Universities are progressively incorporating ESD into their curricula to equip future professionals with sustainability capabilities and ethical consciousness (García-Feijoo et al., 2020). Nonetheless, despite institutional congruence with the SDGs in mission statements, execution remains disjointed (Leal Filho et al., 2019).

According to Ferrer-Estévez and Chalmeta (2021), integrating ESD throughout educational systems is crucial for the attainment of SDGs. This analysis examines how higher education institutions implement sustainability via strategic planning, curricular reform, and digital transformation – three essential elements for promoting systemic change in higher education.

1.1. Problem Statement & Rationale for the Study

Despite numerous universities openly endorsing the SDGs, its incorporation into pedagogy, research, and institutional practices remains disjointed (Leal Filho et al., 2019; Ruiz-Mallén & Heras, 2020). Challenges encompass inadequate coordination, inflexible curricula, and fragmented research initiatives that hinder multidisciplinary collaboration. Initiatives for SDG awareness are frequently sporadic and lack sustained integration. This paper examines the necessity of integrating sustainability into higher education through strategic planning, curriculum reform, and digital transformation.

1.2. Aim and Research Objectives

This analysis intends to rigorously analyse the integration of sustainability inside HEIs. The study examines how universities align with the SDGs by examining contemporary literature on institutional initiatives, curricular reform, and digital integration.

The objectives are: (1) to examine the integration of sustainability into strategic planning and governance by HEIs; (2) to evaluate the incorporation of ESD within curricula; and (3) to assess the impact of digital transformation on sustainability-oriented initiatives in higher education environments.

1.3. Significance of the Study

Comprehending the implementation of sustainability in higher education is essential for achieving the 2030 Agenda. Despite numerous institutions professing dedication to the SDGs, substantial discrepancies persist in converting intention into action. This study adds by synthesising recent academic research to elucidate structural and pedagogical characteristics that facilitate or obstruct sustainable integration. The analysis offers insights for policymakers, academic leaders, and educators aiming to enhance ESD through a cohesive and systematic approach, concentrating on institutional strategy, curriculum, and digital infrastructure across universities.

2. Methodology

2.1. Search Strategy and Databases

To identify relevant literature, major academic databases such as Scopus, Web of Science, ScienceDirect, and Google Scholar were used. These databases were selected for their interdisciplinary scope and high-quality peer-reviewed coverage of sustainability in higher education. Search terms included combinations of: *"higher education" OR "university*" AND "sustainable development" OR "SDGs" OR "2030 Agenda". Boolean operators and truncation were used to maximise results. The strategy followed established protocols to ensure comprehensive coverage and relevance, aligning with prior research in sustainability and educational review methods.

2.2. Screening and Inclusion Criteria

The selection process followed standard narrative review practices. Only peer-reviewed journal articles published between 2015 and 2024 were included, reflecting the timeline following the adoption of the 2030 Agenda. Articles were screened based on relevance to sustainability in higher education, with a focus on institutional strategy, curriculum, and digital transformation. Studies had to address at least one of these dimensions and be written in English. Grey literature, conference proceedings, and studies focused solely on primary or secondary education were excluded, ensuring that the final set captured empirical and conceptual insights specific to higher education institutions.

2.3. Data Analysis and Thematic Synthesis

A qualitative theme synthesis method was utilised to collect and examine information from the chosen articles. In accordance with standard procedures in sustainability assessments, publications were thoroughly examined and

categorised based on prevalent themes, including institutional strategy, curriculum reform, and digital transformation. This technique utilised narrative synthesis protocols to aggregate insights from empirical instances and theoretical inputs. Thematic categories were not predetermined but formed inductively through the reading and examination of texts, consistent with established approaches in qualitative educational research.

3. Results

3.1. Institutional Strategy and Commitment to the SDGs

The strategic incorporation of the SDGs within HEIs has become a fundamental measure for systematically embedding sustainability. HEIs have commenced the alignment of their institutional documents, mission statements, and development plans with the 2030 Agenda, however this process exhibits variability across different contexts (Trevisan et al., 2024). Leal Filho et al. (2019) asserted that numerous colleges espouse sustainability in language yet fail to effectively implement it within governance frameworks and decision-making procedures.

Effective institutional commitment necessitates the establishment of internal processes that convert SDG concepts into practical goals. This includes the integration of sustainability in official documents, the creation of sustainability offices or task teams, and active engagement in rating systems that monitor SDG performance (De la Poza et al., 2021; Freidenfelds et al., 2018). Strategic plans connected with the SDGs function as a communication instrument to direct academic and administrative groups (Sonetti et al., 2020).

Obstacles to institutional strategy are both structural and cultural in nature. Horizontal fragmentation among departments generates silos that obstruct cohesive sustainability strategies, whilst vertical barriers within institutional hierarchies can lead to misalignment of priorities between management and academic personnel (Oliver Su et al., 2018). These obstacles hinder standardisation and coherence in the execution of sustainability-related content, frequently resulting in academics and researchers lacking institutional support or explicit instructions.

Serafini et al. (2022) observed that whereas numerous colleges have publicly affirmed their commitment to the SDGs, only a limited number have established strong internal governance frameworks to advance the agenda. The autonomy of individual faculties and the lack of cross-disciplinary coordination mechanisms further hinder institutional transformation.

Case studies indicate that higher education institutions that incorporate sustainability into strategic planning, bolstered by leadership commitment and interdepartmental collaboration, are more likely to attain significant results (Ruiz-Mallén & Heras, 2020; Ambariyanto & Utama, 2020). These institutions can foster both sustainability awareness and a collective sense of duty among all stakeholders.

3.2. Curriculum Reform through Education for Sustainable Development

Incorporating sustainability into university courses is a direct and transformative method by which HEIs can advance the SDGs. This approach necessitates a distinct shift from conventional Environmental Education (EE) to a more holistic framework – ESD, encompassing environmental, social, and economic aspects, as found in Kopnina (2020).

Yadav et al. (2022) contended that EE transitioned from a paradigm centred on environmental issues to one that integrates economic and social considerations, so establishing the foundation for ESD. While EE has historically sought to inform and modify behaviours towards environmental conservation, ESD advocates for systems thinking, participatory learning, and intergenerational equity. Brundiers and Wiek (2017) emphasised the necessity of cognitive, emotive, and participative teaching methods to develop sustainability competences.

Nevertheless, curriculum reform continues to provide a persistent obstacle. Fissi et al. (2021) asserted that numerous faculties are unable to effectively include sustainability topics because of academic silos and antiquated educational methods. Effective implementation of ESD cultivates critical and systemic thinking, allowing students to comprehend the long-term consequences of their decisions and behaviours (Riess et al., 2022).

Case studies demonstrate that effective integration necessitates the incorporation of targeted sustainability-oriented courses as well as their interdisciplinary application. In a research on engineering education, Wiek and Kay (2015) proposed converting pollution control training into sustainability-oriented problem solving, indicating a significant curricular transformation beyond supplementary modules. Holgaard et al. (2016) conducted a cross-national comparison of engineering programs, indicating that the integration of ESD must be contextualised and linked to

professional abilities. Notwithstanding heightened awareness, Acosta Castellanos and Queiruga-Dios (2021) determined that ESD remains an immature and non-standardized framework in higher education. Numerous places continue to exhibit resistance or ambiguity about EE and ESD, especially in the absence of advice or when local implementation frameworks are inadequately constructed.

Ultimately, curricular reform for sustainability transcends the mere incorporation of environmental subjects. It necessitates instructional reform, multidisciplinary cooperation, and a collective understanding of education's function in fostering a more equitable and sustainable world.

3.3. Digital Transformation in Support of Sustainability

Digital Transformation (DT) is widely acknowledged as a significant facilitator for integrating sustainability inside HEIs. With the diminishing reliance on physical infrastructure for knowledge dissemination, digital tools, such as e-learning platforms, smart technologies, and data-driven systems, have enhanced universities' ability to educate for sustainable development (Carayannis & Morawska-Jancelewicz, 2022).

Abad-Segura et al. (2020) asserted that integrating excellent education with technology enables students to more effectively gain information and motivation connected to sustainability. These technologies facilitate the development of sustainable competences by fostering collaborative, interdisciplinary, and context-specific learning environments. Nikou and Aavakare (2021) asserted that digital transformation promotes innovative educational models that correspond with social and technological advancements, hence enabling a re-evaluation of teaching methodologies and institutional frameworks.

A burgeoning field of research is the creation of intelligent and sustainable campuses. These projects employ intelligent infrastructure, such as sensors, IoT systems, and real-time monitoring platforms, to diminish energy usage, control trash, and enhance transportation systems, thereby aligning campus operations with SDG targets (Chagnon-Lessard, 2021). These systems function as "living laboratories" for students, providing immersive learning opportunities that connect digital abilities with sustainability awareness.

Digital platforms promote sustainability governance by improving openness, enabling real-time reporting, and easing institutional accountability (Raji & Hassan, 2021). These tools enable higher education institutions to more effectively link their operations with the 2030 Agenda by mapping sustainability projects and assessing their effects.

Notwithstanding these advantages, obstacles persist. Research on the technologies implemented across campuses and their efficacy in promoting sustainability objectives is sparse (Schina et al., 2020). Furthermore, digital inequality endures; not all students or faculty possess equivalent access to technical resources or expertise, resulting in disparities in the accessibility and equity of sustainability education (Bruhn-Zass, 2021; Núñez-Canal et al., 2022).

Digital transformation signifies a fundamental change in the manner in which HEIs provide sustainability education and fulfil their institutional obligations. If implemented equitably, it can serve as a catalyst for systemic transformation across curricula, operations, and research ecosystems.

4. Summary of Key Findings

This review identified three core themes that reflect the most prominent approaches through which HEIs are embedding sustainability in alignment with the 2030 Agenda.

First, under the theme of Institutional Strategy and Commitment to the SDGs, the literature consistently highlights the strategic alignment of HEIs with the SDGs through mission statements, institutional plans, and policy documents (Trevisan et al., 2024; Leal Filho et al., 2019). Effective implementation requires internal mechanisms such as sustainability task forces and participation in SDG-related ranking systems (De la Poza et al., 2021; Freidenfelds et al., 2018). However, many institutions face structural and cultural barriers, including interdepartmental silos and weak horizontal or vertical coordination, that limit systemic uptake (Oliver Su et al., 2018; Serafini et al., 2022). Case studies show that interdepartmental collaboration and committed leadership are critical for meaningful integration (Ruiz-Mallén & Heras, 2020; Ambariyanto & Utama, 2020).

Second, Curriculum Reform through ESD emerges as a direct pathway for embedding sustainability in pedagogy. The transition from traditional EE to ESD reflects a more comprehensive, interdisciplinary, and participatory model (Kopnina, 2020; Yadav et al., 2022). ESD fosters cognitive, affective, and participatory competencies required for

sustainability-focused problem solving (Brundiers & Wiek, 2017). Yet, its implementation is uneven due to outdated curricula, fragmented faculty structures, and lack of institutional guidance (Fissi et al., 2021; Riess et al., 2022). Successful cases demonstrate the value of contextualising ESD within professional education, particularly in engineering and applied sciences (Wiek & Kay, 2015; Holgaard et al., 2016). Despite growing interest, ESD remains a non-standardised and underdeveloped framework in many regions (Acosta Castellanos & Queiruga-Dios, 2021).

Table 1 Summary of Key Findings

Theme	Subthemes	References
Institutional Strategy and Commitment to the SDGs	Strategic alignment with the 2030 Agenda SDG integration in mission and planning Governance structures and sustainability offices Barriers: fragmentation, lack of coordination	Leal Filho et al. (2019); Trevisan et al. (2024); De la Poza et al. (2021); Freidenfelds et al. (2018); Sonetti et al. (2020); Oliver Su et al. (2018); Serafini et al. (2022); Ruiz-Mallén & Heras (2020); Ambariyanto & Utama (2020)
Curriculum Reform through Education for Sustainable Development (ESD)	Shift from Environmental Education (EE) to ESD ESD as a holistic, systemic pedagogy Pedagogical innovation and sustainability competences Disciplinary silos and outdated methods ESD integration in professional programmes	Kopnina (2020); Yadav et al. (2022); Brundiers & Wiek (2017); Fissi et al. (2021); Riess et al. (2022); Wiek & Kay (2015); Holgaard et al. (2016); Acosta Castellanos & Queiruga-Dios (2021)
Digital Transformation in Support of Sustainability	Digital learning platforms and context-based tools Smart and sustainable campuses Digital governance and accountability Barriers: digital inequality, limited research on impact	Carayannis & Morawska-Jancelewicz (2022); Abad-Segura et al. (2020); Nikou & Aavakare (2021); Chagnon-Lessard (2021); Raji & Hassan (2021); Schina et al. (2020); Bruhn-Zass (2021); Núñez-Canal et al. (2022)

Third, the theme of DT in Support of Sustainability reflects the increasing use of digital tools to enhance sustainability education and campus operations. Technologies such as e-learning platforms, IoT systems, and sustainability dashboards enable both efficient teaching and data-driven decision-making (Carayannis & Morawska-Jancelewicz, 2022; Chagnon-Lessard, 2021). These tools facilitate collaboration, transparency, and real-time sustainability tracking (Raji & Hassan, 2021). However, digital inequality and limited research on implementation strategies remain persistent challenges (Schina et al., 2020; Bruhn-Zass, 2021; Núñez-Canal et al., 2022).

5. Conclusion

Together, these findings demonstrate that while substantial progress has been made, sustainability integration across HEIs remains complex and uneven. Structural coherence, curricular transformation, and equitable digital infrastructure remain central to future advancement.

5.1. Theoretical and Practical Implications

This analysis theoretically underscores the necessity for a multifaceted approach to sustainability in higher education, integrating governance, teaching, and digital infrastructure. It asserts that ESD should be regarded not as an isolated curriculum but as a pervasive institutional necessity. The findings emphasise the significance of leadership commitment, coordinated strategic planning, and faculty engagement in overcoming institutional hurdles. Institutions must promote interdisciplinary collaboration, invest in digital infrastructure, and provide broad access to sustainability education. These measures are crucial for universities to function as transformative agents in attaining the SDGs.

5.2. Future Research Direction

Future study should examine the long-term effects of institutional strategies on sustainability outcomes, especially in varied geographic and socio-economic contexts. Additional empirical research is required to assess the impact of digital

tools and smart campus activities on sustainability capabilities and behavioural change in students. Moreover, comparative assessments of the disciplinary integration of ESD, particularly in domains outside of engineering, can provide profound insights into curriculum change. Ultimately, research ought to investigate the impact of student and faculty perspectives on the efficacy of sustainability measures, as well as how institutional culture and leadership paradigms affect the speed and success of SDG implementation in higher education institutions.

Compliance with ethical standards

Disclosure of conflict of interest

All authors declare that they have no conflicts of interest.

References

[1] Abad-Segura, E., González-Zamar, M.-D., Infante Moro, J. C., & García, G. (2020). Sustainable Management of Digital Transformation in Higher Education: Global Research Trends. Sustainability, 12, 2107. https://doi.org/10.3390/su12052107

[2] Acosta Castellanos, P. M., & Queiruga-Dios, A. (2022). From environmental education to education for sustainable development in higher education: A systematic review. International Journal of Sustainability in Higher Education, 23(3), 622–644. https://doi.org/10.1108/IJSHE-04-2021-0167

[3] Ambariyanto, A., & Utama, Y. J. (2020). Educating Higher Education Institutions to Support SDGs: Indonesian Case. E3S Web of Conferences, 202, 02015. https://doi.org/10.1051/e3sconf/202020202015

[4] Bruhn-Zass, E. (2022). Virtual Internationalization to Support Comprehensive Internationalization in Higher Education. Journal of Studies in International Education, 26(2), 240–258. https://doi.org/10.1177/10283153211052776

[5] Brundiers, K., & Wiek, A. (2017). Beyond Interpersonal Competence: Teaching and Learning Professional Skills in Sustainability. Education Sciences, 7(1), Article 1. https://doi.org/10.3390/educsci7010039

[6] Carayannis, E. G., & Morawska-Jancelewicz, J. (2022). The Futures of Europe: Society 5.0 and Industry 5.0 as Driving Forces of Future Universities. Journal of the Knowledge Economy, 13(4), 3445–3471. https://doi.org/10.1007/s13132-021-00854-2

[7] Chagnon-Lessard, N., Gosselin, L., Barnabe, S., Bello-Ochende, T., Fendt, S., Goers, S., Silva, L. C. P. D., Schweiger, B., Simmons, R., Vandersickel, A., & Zhang, P. (2021). Smart Campuses: Extensive Review of the Last Decade of Research and Current Challenges. IEEE Access, 9, 124200–124234. https://doi.org/10.1109/ACCESS.2021.3109516

[8] De La Poza, E., Merello, P., Barberá, A., & Celani, A. (2021). Universities' Reporting on SDGs: Using THE Impact Rankings to Model and Measure Their Contribution to Sustainability. Sustainability, 13(4), 2038. https://doi.org/10.3390/su13042038

[9] Ferrer-Estévez, M., & Chalmeta, R. (2021). Integrating Sustainable Development Goals in educational institutions. The International Journal of Management Education, 19(2), 100494. https://doi.org/10.1016/j.ijme.2021.100494

[10] Fissi, S., Romolini, A., Gori, E., & Contri, M. (2021). The path toward a sustainable green university: The case of the University of Florence. Journal of Cleaner Production, 279, 123655. https://doi.org/10.1016/j.jclepro.2020.123655

[11] Freidenfelds, D., Kalnins, S. N., & Gusca, J. (2018). What does environmentally sustainable higher education institution mean? Energy Procedia, 147, 42–47. https://doi.org/10.1016/j.egypro.2018.07.031

[12] García-Feijoo, M., Eizaguirre, A., & Rica-Aspiunza, A. (2020). Systematic Review of Sustainable-Development-Goal Deployment in Business Schools. Sustainability, 12(1), 440. https://doi.org/10.3390/su12010440

[13] Holgaard, J. E., Hadgraft, R., Kolmos, A., & Guerra, A. (2016). Strategies for education for sustainable development – Danish and Australian perspectives. Journal of Cleaner Production, 112, 3479–3491. https://doi.org/10.1016/j.jclepro.2015.09.063

[14] Ketlhoilwe, M. J., Silo, N., & Velempini, K. (2020). Enhancing the Roles and Responsibilities of Higher Education Institutions in Implementing the Sustainable Development Goals. In G. Nhamo & V. Mjimba (Eds.), Sustainable

Development Goals and Institutions of Higher Education (pp. 121–130). Springer International Publishing. https://doi.org/10.1007/978-3-030-26157-3_10

[15] Kopnina, H. (2020). Education for the future? Critical evaluation of education for sustainable development goals. The Journal of Environmental Education, 51(4), 280–291. https://doi.org/10.1080/00958964.2019.1710444

[16] Leal Filho, W., Skanavis, C., Kounani, A., Brandli, L. L., Shiel, C., Paço, A. D., Pace, P., Mifsud, M., Beynaghi, A., Price, E., Salvia, A. L., Will, M., & Shula, K. (2019). The role of planning in implementing sustainable development in a higher education context. Journal of Cleaner Production, 235, 678–687. https://doi.org/10.1016/j.jclepro.2019.06.322

[17] MCKeown, R., & Hopkins, C. (2007). Moving Beyond the EE and ESD Disciplinary Debate in Formal Education. Journal of Education for Sustainable Development, 1(1), 17–26. https://doi.org/10.1177/097340820700100107

[18] Nikou, S., & Aavakare, M. (2021). An assessment of the interplay between literacy and digital Technology in Higher Education. Education and Information Technologies, 26, 1–23. https://doi.org/10.1007/s10639-021-10451-0

[19] Núñez-Canal, M., de Obesso, M., & Pérez-Rivero, C. (2022). New challenges in higher education: A study of the digital competence of educators in Covid times. Technological Forecasting and Social Change, 174, 121270. https://doi.org/10.1016/j.techfore.2021.121270

[20] Oe, H., Yamaoka, Y., & Ochiai, H. (2022). A Qualitative Assessment of Community Learning Initiatives for Environmental Awareness and Behaviour Change: Applying UNESCO Education for Sustainable Development (ESD) Framework. International Journal of Environmental Research and Public Health, 19(6), Article 6. https://doi.org/10.3390/ijerph19063528

[21] Oliver Su, Y., Chen, K.-F., Tsai, Y.-P., & Su, H.-I. (2018). How universities can work together with local communities to create a green, sustainable future. E3S Web of Conferences, 48, 06001. https://doi.org/10.1051/e3sconf/20184806001

[22] Raji, A., & Hassan, A. (2021). Sustainability and Stakeholder Awareness: A Case Study of a Scottish University. Sustainability, 13(8), Article 8. https://doi.org/10.3390/su13084186

[23] Riess, W., Martin, M., Mischo, C., Kotthoff, H.-G., & Waltner, E.-M. (2022). How Can Education for Sustainable Development (ESD) Be Effectively Implemented in Teaching and Learning? An Analysis of Educational Science Recommendations of Methods and Procedures to Promote ESD Goals. Sustainability, 14(7), 3708. https://doi.org/10.3390/su14073708

[24] Ruiz-Mallén, I., & Heras, M. (2020). What Sustainability? Higher Education Institutions' Pathways to Reach the Agenda 2030 Goals. Sustainability, 12(4), Article 4. https://doi.org/10.3390/su12041290

[25] Schina, D., Esteve-González, V., Cantabrana, J., & Gisbert, M. (2020). The Integration of Sustainable Development Goals in Educational Robotics: A Teacher Education Experience. Sustainability, 12, 1–15. https://doi.org/10.3390/su122310085

[26] Serafini, P. G., Moura, J. M. D., Almeida, M. R. D., & Rezende, J. F. D. D. (2022). Sustainable Development Goals in Higher Education Institutions: A systematic literature review. Journal of Cleaner Production, 370, 133473. https://doi.org/10.1016/j.jclepro.2022.133473

[27] Viera Trevisan, L., Leal Filho, W., & Ávila Pedrozo, E. (2024). Transformative organisational learning for sustainability in higher education: A literature review and an international multi-case study. Journal of Cleaner Production, 447, 141634. https://doi.org/10.1016/j.jclepro.2024.141634

[28] Wiek, A., & Kay, B. (2015). Learning while transforming: Solution-oriented learning for urban sustainability in Phoenix, Arizona. Current Opinion in Environmental Sustainability, 16, 29–36. https://doi.org/10.1016/j.cosust.2015.07.001

[29] Yadav, S. K., Banerjee, A., Jhariya, M. K., Meena, R. S., Raj, A., Khan, N., Kumar, S., & Sheoran, S. (2022). Environmental education for sustainable development. In Natural Resources Conservation and Advances for Sustainability (pp. 415–431). Elsevier. https://doi.org/10.1016/B978-0-12-822976-7.00010-7