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# Attitude and practices of higher education academics on education for sustainable development

This research paper explores the views and perceptions of academics towards embedding Education for Sustainable Development (ESD) into their academic practices and presents study findings on academics' views on ESD. This study utilized anonymous questionnaires to obtain participant opinions. Participants were encouraged to share personal practices around ESD. This study observed that academics have a diverse perception of the ESD concept, and most academics are aware of ESD to some extent. The results indicate the presence of a statistical relationship between academics' years of experience in higher education (HE) and their awareness of ESD. Also, early career academics are more likely to be open to incorporating ESD into their teaching practices. In addition to these, this paper discussed that while academics may or may not already be incorporating ESD into their teaching practices, institutional commitment to embedding ESD into policies, staff training, curriculum development, and assessment is critical in ensuring effective integration of ESD into HE.

**Keywords:** attitude and practices, education for sustainable development, higher education, academics, curriculum

## Introduction

The term 'environmental education' has been used for nearly three decades in the academic community to promote an awareness of environmental issues. It is thought that poor utilization of environmental resources, socio-economic development, and global problems has led to a need to educate society on these environmental issues. These concerns led to the introduction of the term Education for Sustainable Development (ESD) to incorporate an awareness of the global problems around sustainability into the education system (Hallinger & Chatpinyakoo, 2019). It is believed that education at all levels can provide an awareness of global issues and initiate environmental protection commitment (Lozano et al., 2015). The United Nations Educational, Scientific and Cultural Organization (UNESCO) ESD 2030 programme is aimed at personal and societal changes towards societal, environmental, and economic issues in a holistic approach (UNESCO, 2022).

## Challenges of ESD

HE plays a vital role in ESD initiatives. While there is an increase in the institutional interest and commitments to ESD (this includes operational, research, teaching, evaluation, reporting, etc.) across the globe, it appears implementation has been limited (Lozano et al., 2015). Achieving these ESD goals could have been limited due to higher aspirations by institutions, low efforts in implementation, or lack of sufficient promotion of ESD across institutions (Holm, Vuorisalo, & Sammalisto, 2015). Despite the importance of ESD, the reluctance of some institutions to actively engage in the area could be due to various reasons. In a survey evaluating limitations to sustainability in institutions, respondents highlighted various ESD-limiting barriers such as the abstract nature of ESD, broadness of ESD, lack of personnel, lack of scientific basis for ESD, need for additional resources, and competition. While some of these opinions could be subjective, the report noted that ESD potential was not fully achieved across institutions (Leal Filho, 2010). Changing human attitudes to ESD would take time and might be challenging. Despite being relatively slow, the path to ESD is gradually expanding (Caetano & Felgueiras, 2020), although the level of effectiveness is yet to be evaluated.

## Sustainable development

Sustainable development (SD) is generally considered in three (or sometimes four) connected dimensions – societal, environmental, economic, and cultural. Reports suggest HE institutions do not fully understand the importance and challenges of SD and may still consider the idea novel. This is evident in how researchers understand what SD means and controversies on whether there are valid reasons why the concept should be incorporated into the curriculum (Cotton, Warren, Maiboroda, & Bailey, 2007). While some see the idea within the scope of knowledge transfer, some see it within the scope of personal development (Milutinović & Nikolić, 2014), while others view it within the scope of societal and environmental issues. There are other uncertainties regarding sustainability's scope, application, and limitations in the educational context (Jones, Trier, & Richards, 2008). This research explores ESD within the scope of socio-economic–environment responsibilities towards global issues to achieve an ecologically sustainable society.

In order for ESD to be implemented in HE, various institutional aspects must work together. Institutions' operations, research, teaching, outreach and collaboration, assessment, and reporting activities have been shown to be interrelated (Lozano et al., 2015), broadly grouped into curriculum and the community (Müller-Christ et al., 2014). While it is essential to integrate ESD holistically into an institution's system, integrating ESD into the curriculum can be challenging. In a study that identified twenty-five limitations to ESD, a lack of support from management was identified as the most crucial limitation. In contrast, a lack of applicability and continuity was the slightest obstacle (Leal Filho et al., 2017). While it is hard to quantify the extent of these obstacles, the university teaching around SD is an essential aspect of ESD. For example, an academic might consider a failure to introduce ESD into a curriculum as a lack of support from

management. At the same time, the institution might question the relevance of SD to the course.

Interestingly, another academic might think ESD is necessary but not to be introduced into the curriculum. Thus, a lack of awareness, interest, and understanding of ESD might influence their interest in implementing SD into teaching practices. A sense of irrelevance of ESD to disciplines has been identified as influencing an academic's attitude towards SD (Cotton, Bailey, Warren, & Bissell, 2009). Similarly, a lack of institutional support could impact the academic's commitment to ESD (Cebrián, Grace, & Humphris, 2015).

## HE commitment to ESD

As more universities commit to ESD, incorporating ESD into the university structure is vital. A common reason for the reduced implementation of ESD by HE institutions is a lack of policies and operational commitment (Leal Filho et al., 2017). For example, the University of Liverpool provides two precise approaches via its Centre for Innovation in Education (CIE). First, the university commits to SD via the university's sustainability strategies (for example, hitting a net zero carbon by 2035, refer to <https://www.liverpool.ac.uk/sustainability/>). Secondly, and possibly more critical from a teaching perspective, is the incorporation of ESD into the curriculum. Liverpool Curriculum Framework (CIE, 2021) was designed to foster student confidence, digital fluency, and global citizenship. Students, as global citizens, are conscious of their community, inclusive, and understand the global context. Incorporating ESD into the curriculum supports students in understanding how their programme of study interconnects with global issues. This brings the question of the relevance of ESD to different professions.

It has been shown that the level of incorporation of ESD into the curriculum varies across disciplines and education levels (Lozano et al., 2015). While it may be possible to have separate 'applied learning' ESD-focused modules in undergraduate and foundation-level courses (Ash & Clayton, 2009), achieving this might be more challenging for postgraduate programmes. Thus, the question is, to what extent should ESD be incorporated into the curriculum in each programme? In competency-based courses (such as veterinary medicine), the relevance and extent of ESD incorporation into the curriculum would always be debatable, especially when regulatory bodies monitor these courses. Thus, rethinking the current curriculum and interdisciplinary approach would be required for implementing ESD from a teaching perspective, as previously reiterated (Cotton et al., 2009; Howlett, Ferreira, & Blomfield, 2016).

## Teaching practices in ESD

Integrating ESD into teaching requires a transformative approach to learning aimed at encouraging critical learning and socio-cultural challenges (Mahmud & Rahman, 2018). This refers to a fundamental change in teaching and learning culture (Sterling, 2004). The concept of learning by doing described as 'project-based learning' has been

described as a pedagogic approach to implementing ESD. In this student-oriented approach, students are tasked with problem-solving projects or topics (Leal Filho & Pace, 2016). While students must be actively involved in these learning approaches, appropriate choice of projects or issues by academics or students will be critical for ESD-related learning to be effective. While students may or may not find these SD-related topics necessary, ongoing questions about student perception and understanding are required.

Academics are critical in ensuring ESD is incorporated into teaching and learning. Three broad concepts of teaching SD have been identified (Dawe, Jucker, & Martin, 2005). The first concept involves academics acting as role models to students towards ESD, while the second concept involves an 'experiential approach' where academics use real-life issues for ESD. The third approach adopts a 'holistic' approach to ESD. While the actual scope of 'holistic' can be challenging to structure and evaluate, it could provide an interconnected approach to ESD for both learners and teachers. Irrespective of the method adopted by an academic, a change from the traditional teaching approach may be needed. However, changing the teaching approach requires motivation and determination.

Interestingly, it has been noted that more experienced academics, such as professors, are more likely to be reluctant to change their teaching approach to incorporate ESD due to concerns about a lack of time (Jones et al., 2008; Mokski, Leal Filho, Sehnem & de Andrade, 2022). The lack of motivation by academics towards ESD was attributed to a lack of incentive by a participant in a study (Jones et al., 2008). This begs the question, is a lack of incorporation of ESD into the curriculum due to the institution's perceived insignificance of ESD, an academic's personal issue, a perception of student's lack of interest, or due to a combination of other factors?

While ESD can be incorporated across various organizational structures of an HE, clear and active organizational commitment is essential. For most HE institutions, preparing students for employment is vital. However, preparing students for the unknown future is also crucial to university education (Leal Filho & Pace, 2016). While academics play a pivotal role in preparing students for employability, finding the right balance between teaching for employability and ESD is vital to improving the students' awareness of SD.

## Research context

According to a UNESCO report, at least 40% of educators can confidently teach climatic change. In contrast, only 20% can explain to students how they should respond to climate change-related societal issues (UNESCO, 2021). Whilst this report focused on formal primary and secondary education, there is no substantial evidence to conclude that findings will be similar in HE. As previously discussed, there are various stakeholders in ESD in HE. The role of HE academics in ESD is of particular importance, especially since personal interest and motivation seem to influence academics' commitment to ESD (Jones et al., 2008). It has been shown that a lack of deep under-

standing of what ESD entails, poor curriculum structure, organization structure, and many other factors negatively influence ESD incorporation in HE (Cebrián et al., 2015). Despite these challenges, individual perception and commitment are at the centre of ESD for academics.

In this study, the perception of academics towards ESD in the U.K. is investigated to assess personal views, irrespective of the presence or a lack of organization structure towards ESD. This study was designed to explore practices (or a lack of practice) of academics around ESD to provide insight into adoptable practices from a reflective standpoint, thus, suggesting how academic practices can be improved by incorporating good ESD-related practices of study participants.

## Methods

This study used an anonymous online survey to investigate the attitude and perspective of academics in the U.K. The research was primarily designed to target peers on the PGCert Academic Practice course (these are predominantly academics in the University of Liverpool enrolled in the academic development programme) and also other academic staff in the university. Survey completion links were shared on various cohort teams' pages. In order to capture the thoughts of academics from outside the University of Liverpool, survey links were cascaded to colleagues outside the University of Liverpool but within the U.K. The survey was opened to staff (lecturers, tutors, teaching fellows, and non-academic staff) who provide teaching-related activities in HE in the U.K., irrespective of discipline.

### Survey design and data collection

Data collection was done over four months, from October 2022 to January 2023, with the survey closed after the collection period. The survey was designed using Microsoft Forms. The survey used a mixture of short open and closed-ended questions; participant responses were collated. In addition to these, participant opinion regarding nine predefined statements was recorded. Participants' views on these nine statements were recorded as 'Extremely disagree', 'Somewhat disagree', 'Neutral', 'Somewhat agree', and 'Extremely agree'. Participants were also asked to describe in three words what teaching means on a personal level. In an attempt to evaluate academics' understanding of ESD, participants were provided with various simple definitions of ESD and asked to select which definition they agreed with. Where participants wished to provide additional explanations of ESD, the survey was designed in a way to capture their views.

In order to evaluate if the incorporation of ESD into academic practices was related to discipline, age, and years of teaching in HE, the survey was designed to accept these responses from participants. Participant disciplines were grouped (humanities, natural and applied sciences, engineering, social sciences, business, 'not applicable', and 'others'), while participant age was grouped into age categories (18 to 24 years, 25 to 34 years, 35 to 44 years, 45 to 54 years, 55 to 64 years, and over 65 years). Participants'

total number of years in HE was also gathered and grouped (less than 5 years, 5 to 10 years, over 10 years, and not applicable). Irrespective of grouping, every participant was asked to rate their personal understanding of teaching for SD in HE on a scale of 0 to 10 (Figure 1a).

A vital aspect of this research was to explore current ESD-related practices where available to provide other academics with a reflective suggestion and opportunity to incorporate ESD into their practices. Participants in this research were asked to share their individual academic practices tailored to ESD initiatives in their own words. Finally, participants were asked to rate the extent to which the survey (on a scale of 1 to 10) initiated their thought on ESD (Figure 1b) and share additional thoughts with the investigator.

### Data analysis

After the data collection deadline, survey responses were downloaded and analysed. NVivo (Release 1.7.1 – 1534) software was used to analyse open-ended questions and to generate a word cloud (Jackson & Bazeley, 2019) depicting the frequency of words used by participants to describe ESD. Jamovi (version 2.2.5) was used for statistical analysis (Şahin & Aybek, 2019). An independent chi-square statistical test was used to test the statistical relationship between participant responses (a  $P < 0.05$  was considered significant).

### Ethical considerations

This research was conducted as part of the 'ADEV702 Scholarly Investigation of Practice' module on the PGCert programme in academic practice at the Academy, University of Liverpool, for which a module-level ethical approval was granted. Participation in the questionnaire was voluntary, and no participant-identifiable data was collected. Also, prior to completing surveys, participants were provided with additional information regarding the research, purpose, use of data, and option to opt out of the survey.

## Results and discussion

Over the four months of releasing the anonymous questionnaire, a total of fifty-seven consenting participant responses were collated, out of which participants teach in humanities ( $n = 2$ ), natural and applied sciences ( $n = 26$ ), engineering ( $n = 5$ ), social sciences ( $n = 8$ ), business ( $n = 3$ ), veterinary sciences ( $n = 10$ ), and others ( $n = 3$ ). Out of the fifty-seven participants, 14% ( $n = 8$ ) of participants were currently enrolled on the University of Liverpool Postgraduate Certificate in Academic Practice (PGCAP) course, while 86% ( $n = 49$ ) were not on the programme. Out of the participants not enrolled on the programme, 86% were academics in the U.K. Results also indicate that 54% of academics in this study, excluding those enrolled in the PGCAP, indicated this survey challenged them to reflect on their academic practices around SD (Figure 1b).

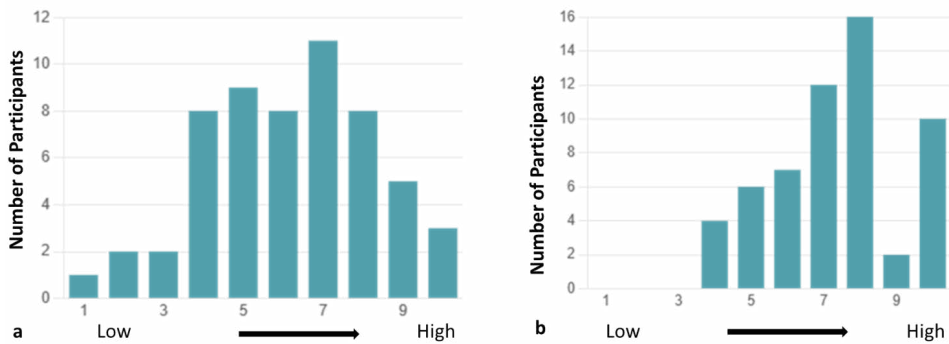


Figure 1 Overview of participants' understanding of their teaching towards SD (plot a) suggesting majority of academics appear to have a good understanding of ESD. The finding indicates that while the survey might not have initiated academics' thoughts towards ESD, it seems few of the academics who had minimal understanding of ESD appear to have acquired a sense of perception of what teaching for SD entails (plot b). Plots are based on participant responses on a scale of 1 (low) to 10 (high).

Whilst the number of responses from participants on the PGCAP programme was relatively low, most participants shared personal views on how they would incorporate ESD into their teaching. One participant suggested that an approach would be to foster

discussion between students on the issues faced in the context of the topic taught. Then provide learning for the skills and attitudes that are needed for success in these areas. Ensure that assessments and assessment criteria include explicit mention to sustainability and/or the consideration of wider environmental and societal impact.

Another stressed the importance of assisting students to 'think critically and question all policies', while one pointed out the need for integrating policies and choices into 'environmental sustainability and the subject matter' being taught. The summary of views from this group of participants highlights the importance of integrating policies, curriculum, and teaching practices into student learning experiences.

## Participants' years of experience in academia

Results from this study indicated that most participating academics were predominantly early career academics with nearly five years of teaching experience in HE. 58% of the participants in this research had less than five years of teaching experience in HE. In comparison, 14% and 19% of the total participants had five to ten years and over ten years of HE teaching experience, respectively. The number of teaching experiences of academics in HE matches the age of participants as expected. Previous studies indicate senior academics (such as professors) are reluctant to change and more likely to be uninterested in ESD (Mokski et al., 2022).



From the results of this study, it was difficult to conclude that senior academics are uninterested in incorporating ESD-related practices into their teaching. This limitation could be attributed to reduced responses from participants with five to ten years of teaching experience and those with over ten years of teaching experience, as would likely be the case with most professors. While this study did not request participants to provide information on their career level (i.e. lecturer, senior lecturer, or professor, etc.), the high participant response to the survey among early career academics (with up to five years of teaching experience in HE) coupled with the overall increased awareness of participants on teaching for SD could point to early career academics' openness to ESD. These results could also imply there is an increased awareness of academics on SD or associated with the increasing global publicity of environmental challenges and institutional commitment towards SD across various universities in the U.K.

Given the age of the majority of participants and their career stage, it is likely that staff training initiatives relating to the incorporation of teaching into SD might be more productive in early career academics than in late-career academics. A targeted approach might be required to create an ESD-involved culture among senior academics involved in teaching. In order to create a sustained ESD culture in the academic environment across the various disciplines and multiple HE career levels (i.e. from new academic staff to senior academic staff), designing and actualizing appropriate policies and restructuring the HE curriculum across multiple disciplines would be critical.

## Overview of academics' perception of individual teaching

Findings from this study indicate the majority of participants generally responded in favour of various ESD-related statements discussed in the survey (Figure 2). This finding suggests academic staff understand SD, although it was also noted that the context of what ESD means seemed to vary among academics. This variation in individual perception of what ESD means is expected based on a previous corroborating report which highlighted general doubts about the meaning, scope, and application of teaching for SD (Jones et al., 2008). To further confirm this, using open-ended questions, academics were asked to describe what ESD means to them in three words. It was interesting to note that academics used various terms to describe ESD (Figure 3b). A summary of words used by academics to describe teaching on SD could be summarized as 'teaching to acquire skills for lifelong development', confirming the concept of teaching for sustainability means different things to different academics (Figure 3a).

The majority of participants agreed that their teaching approach equips students with lifelong skills and values needed in society. Similarly, participants felt their institution needs to do more towards ESD (less than 5% disagreed). When asked if their teaching only prepares students for employment, over 50% of participants disagreed. While finding the right balance between preparing students for employability and SD is challenging, the finding suggests academics seem to believe they already include ESD in their teaching (Figure 2).

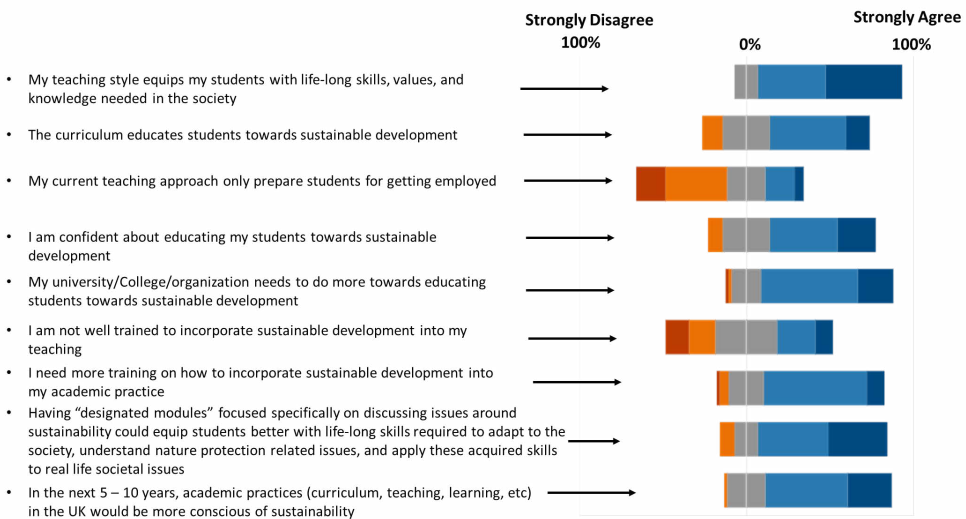


Figure 2 Broad perspective of participants on various statements relating to their academic practices relating to teaching for SD. Figure shows extent to which academics agree to survey statements exploring their understanding and practices around ESD. Colour code: dark orange (extremely disagree), light orange (somewhat disagree), grey (neutral), light blue (somewhat agree), dark blue (extremely agree).

In addition to these findings, the majority of participants agreed that they were confident about their teaching practices around SD, while participants agreed that they needed more training on incorporating ESD into teaching practices. These responses seem contradictory given their answer on the level of training available currently appears well spread out among participants. About 30% of participants disagreed that they are well trained, about 40% were neutral, while a little over 30% of participants agreed they are well trained in incorporating ESD into teaching practices. This could be due to a genuine need for training on the topic of ESD or a lack of academics' desire to admit training is needed (Figure 2).

Although most participants agree that the current curriculum educates students towards sustainability to an extent, academics mostly felt that having designated modules focused on the ESD would benefit students. It was therefore promising to know that participants felt that in the next decade, academic practices across U.K. HE would be more conscious of SD (about 2% disagreed while about 22% were neutral).

## Influence of participant's years of experience on ESD

Statistical analysis indicates that there is a relationship between the number of years in academics in HE (and, to a lesser extent, the age of academic) and their perspective on teaching for SD. The result indicates that academics' response to questionnaire statements on teaching style ( $P < 0.001$ ), academic's confidence in teaching on SD ( $P =$

0.021), level of academic's level of training on ESD ( $P = 0.023$ ), perspective on the need for the institution to be more involved in ESD ( $P = 0.028$ ), and views on the predicted extent of HE's consciousness of sustainability ( $P < 0.001$ ) were each statistically related to academic's number of teaching years in HE. These results could indicate early career academics are more aware of ESD or that the longer academics teach in HE, the more they are open about ESD. Previous observations of professors' lack of interest in ESD (Foley, 2021; Moksiki et al., 2022) suggest that the former is more likely to be true.

## Implications for academic practice

According to one of the participants in this study, there is a need to 'learn what it is exactly' – referring to the scope of ESD. There is a common doubt regarding the scope of ESD in HE (Cebrián et al., 2015), as previously discussed. As demonstrated in this study, academics think of ESD from different perspectives, as shown in Figure 3. While each view is not entirely wrong, the previous research stressed the need for an integrative approach involving financial commitment and more substantial involvement, improved coordination across various HE systems and policies, and an emphasis on best ESD-related practices in HE (Leal Filho, Manolas, & Pace, 2015). A holistic approach to ESD includes staff training and academics' commitment to various formal and informal practices that ensure student learning experiences are done with sustainability in perspective. However, the current HE pedagogic norms such as disciplinarity, lack of concern and understanding, lack of senior management support, and resistance to change are vital obstacles to ESD (Foley, 2021; Leal Filho et al., 2017). Academic interest and commitment are essential in the ESD jigsaw despite curriculum limitations.

With the 'hidden curriculum' informal learning approach to teaching, some academics are already incorporating ESD into their academic practice (Jackson, 1968). As one participant puts it

most staff I come across are engaged in this type of teaching already – whether they know it or not – or are willing to learn more about it [...] to incorporate [...] sustainable development in their teaching

However, this does not undermine the need for a formal structured approach via institution policy, curriculum redesign, and appropriate staff training, irrespective of discipline. Staff may already subconsciously be incorporating sustainability in their teaching, but there are still questions regarding relevance to every field. For example, a participant commented that 'I wonder if teaching for sustainable development is applicable to all subjects' while another commented that 'at the pace the world is developing and changing it is key to sustain the resources we have' stressing the need to 'involve all members of the community to play their part' in achieving SD. In order to engage academics in ESD, the seven key action strategies proposed will be vital to ensure everyone is involved (Cebrián et al., 2015), with a particular focus on early career academics. As pointed out in this study, a targeted staff training approach could

ensure early career academics develop an ESD-conscious approach to their teaching practice. In addition to these, institution's commitment to ESD initiatives, staff training, commitment to student development via embedding SD into curriculum irrespective of discipline, and clear communication of institutional strategies on ESD will be vital in ensuring ESD is significantly developed in the next decade.

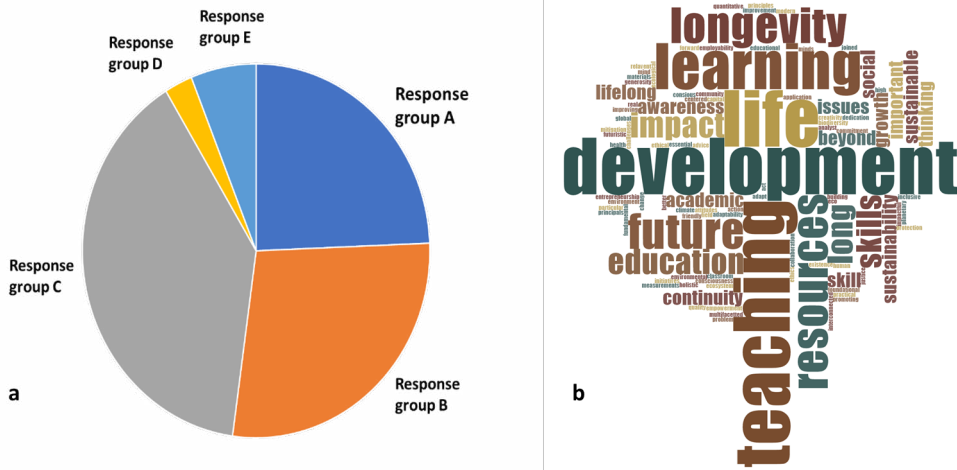


Figure 3 Academics' understanding of what sustainability in HE means to them. Participant responses indicate a diverse perception of ESD (plot a) shows a summation of all responses as multiple answers are allowed). Also, findings suggest that academics have different understandings of ESD, as demonstrated by the word cloud. The word cloud (generated using NVivo Release 1.7.1) shows keywords from the three top words describing what ESD means to participants in the study (plot b). Figure 3 (plot a) colour code: dark blue (response group A – participants understand ESD as supporting academics' professional growth to improve their teaching), orange (response group B - participants understand ESD as teaching students on how to protect natural resources), grey (response group C – participants understand ESD as teaching students the skills needed for lifelong learning), yellow (response group D – participants have no idea of what ESD means), light blue (response group E – participants understand ESD as combination of the three definitions provided).

## Research limitations

This study had some limitations. The number of participants could have been higher to enable a more robust capture of academics' views and practices around ESD. Given data collection was carried out over four months, it would have been valuable to acquire more responses to improve statistical power and academic insights. Also, findings in this study indicate academics' number of years in HE influences their views on ESD. An increased number of responses from academics with more than ten years in HE, particularly late-career academics, could be vital in this study. While it appears early career academics are more likely to be open to participating in this type of study, a

more targeted study approach could ensure views of these category of academics are recorded and explored. Another moot constraint was the challenge of reducing survey questions to minimize completion time while ensuring vital views and opinions are captured. While encouraging participant interest in responding to the questionnaires by making surveys brief and concise was helpful, this study could have benefited from a more robust questionnaire.

## Potential further research

This study provided some evidence that academics are incorporating ESD into their practices, while this may or may not be intentional (Table 1). While this focused primarily on academics and their perspectives on ESD, exploring ESD from the perspective of other stakeholders could provide a holistic understanding of views on ESD. For example, there are limited studies on students' attitudes toward ESD. From personal experience, while some students find SD-oriented sessions (such as climatic change and skills development sessions) enjoyable, they tend to be relaxed about these topics if they are not assessed. Thus, not evaluating these sessions gives students the impression that they are unimportant. Investigating student attitudes, responses, and enthusiasm to ESD-focused modules could enable whether conventional assessment methods are needed and how these assessments can be authentic in line with the university's curriculum framework (CIE, 2021).

**Table 1 Summary of suggestions by academics on ways by which ESD could be incorporated in the HE teaching based on personal academic practices.**

Academic practices	Curriculum and policy	Environmental	Societal
Relating theory to practice to support lifelong learning	Industry-based curriculum development	Environment as both classrooms and instructional aids	Making the students aware about the importance of sustainability
Create sustainability related projects for students to choose from	ESD inclusion in the curriculum	Encourage discussion between students on the issues faced	Using real-life practical scenarios that students can relate with
Designing authentic assessment and learning approaches	Needs to be fundamentally included into all aspects of curriculum	Paper-free, flagging up environmental issues wherever appropriate	Cannot be treated as a separate thing
Repetition of the concept of sustainability is key	Help students to think critically and question all policies	Definition of sustainability in education should be refined	Teaching using life situations

Academic practices	Curriculum and policy	Environmental	Societal
Make sure students have good understanding	It would need to start at curriculum design	Highlighting opportunities to consider sustainable choices	Adaptability for future changes in job duties
Integrating and incorporating nature into teaching and learning processes	Staff continuous professional development to be aware of the current trends in the ecosystem		Map teaching to the UN SDGs
Create more time in lectures to allow students to see the big picture	Subject dependent but need to demonstrate the values as well as teach them		
Providing case studies highlighting the link to sustainability into certain topics within the module	Very useful if the University of Liverpool clarified its strategy on the matter		

## Funding

No funding was obtained for this research.

## Recommendations and conclusion

Previous studies on ESD have identified barriers to ESD (Foley, 2021; Leal Filho et al., 2017; Mokski et al., 2022) and proposed different approaches to incorporating ESD into HE (Cebrián et al., 2015; Leal Filho et al., 2015; Lozano & Lozano, 2014). While some of these barriers were pointed out by participants in this study, responses indicate that some academics are already incorporating ESD into their academic practice. However, a coordinated training approach is needed to improve academic clarity and commitment to ESD. This would reinforce the institutional position on SD and provide a framework to target late-career academic interest in ESD. Also, observations in this study also provide a basis to promote ESD awareness among early career academics as they tend to be more open and committed to incorporating ESD into their academic practices. Based on the findings in this study, it is predicted that with an increased coordinated institutional focus on ESD initiatives such as policy, curriculum, and assessment restructuring, ESD barriers could be diminished significantly in the next decade.

## References

- Ash, S. L., & Clayton, P. H. (2009). Generating, deepening, and documenting learning: The power of critical reflection in applied learning. *Journal of Applied Learning in Higher Education*, 1(1), 25–48.
- Caetano, N., & Felgueiras, C. (2020). Teaching sustainable development in higher education: Changing attitudes, the soft way. *TEEM'20: Eighth international conference on technological ecosystems for enhancing multiculturalism* (pp. 523–527). New York: Association for Computing Machinery.
- Cebrián, G., Grace, M., & Humphris, D. (2015). Academic staff engagement in education for sustainable development. *Journal of Cleaner Production*, 106, 79–86.
- CIE (Centre for Innovation in Education) (2021). Liverpool curriculum framework. *University of Liverpool*. <https://www.liverpool.ac.uk/media/livacuk/centre-for-innovation-in-education/liverpool-curriculum-framework/liverpool-curriculum-framework-booklet.pdf>.
- Cotton, D., Bailey, I., Warren, M., & Bissell, S. (2009). Revolutions and second-best solutions: Education for sustainable development in higher education. *Studies in Higher Education*, 34(7), 719–733.
- Cotton, D. R., Warren, M. F., Maiboroda, O., & Bailey, I. (2007). Sustainable development, higher education and pedagogy: A study of lecturers' beliefs and attitudes. *Environmental Education Research*, 13(5), 579–597.
- Dawe, G., Jucker, R., & Martin, S. (2005). Sustainable development in higher education: Current practice and future developments. *A report to the Higher Education Academy, York (UK)*. <https://www.advance-he.ac.uk/knowledge-hub/sustainable-development-higher-education-current-practice-and-future-developments-o>.
- Foley, H. (2021). Education for sustainable development barriers. *Journal of Sustainable Development*, 14(1). doi:10.5539/jsd.v14n1p52.
- Hallinger, P., & Chatpinyakoo, C. (2019). A bibliometric review of research on higher education for sustainable development, 1998–2018. *Sustainability*, 11(8), 2401.
- Holm, T., Vuorisalo, T., & Sammalisto, K. (2015). Integrated management systems for enhancing education for sustainable development in universities: A memetic approach. *Journal of Cleaner Production*, 106, 155–163.
- Howlett, C., Ferreira, J.-A., & Blomfield, J. (2016). Teaching sustainable development in higher education: Building critical, reflective thinkers through an interdisciplinary approach. *International Journal of Sustainability in Higher Education*, 17(3), 305–321.
- Jackson, P. (1968). *Life in classrooms*. New York: Holt, Rinehart & Wilson.
- Jackson, K., & Bazeley, P. (2019). *Qualitative data analysis with NVivo*. London: Sage.
- Jones, P., Trier, C. J., & Richards, J. P. (2008). Embedding education for sustainable development in higher education: A case study examining common challenges and opportunities for undergraduate programmes. *International Journal of Educational Research*, 47(6), 341–350.
- Leal Filho, W. (2010). Teaching sustainable development at university level: Current trends and future needs. *Journal of Baltic Science Education*, 9(4), 273–284.
- Leal Filho, W., & Pace, P. (2016). *Teaching education for sustainable development at university level*. Cham: Springer International.
- Leal Filho, W., Manolas, E., & Pace, P. (2015). The future we want: Key issues on sustainable development in higher education after Rio and the UN decade of education for sustainable development. *International Journal of Sustainability in Higher Education*, 16(1), 112–129.



- Leal Filho, W., Shiel, C., & Paço, A. (2016). Implementing and operationalising integrative approaches to sustainability in higher education: The role of project-oriented learning. *Journal of Cleaner Production*, *133*, 126–135.
- Leal Filho, W., Wu, Y.-C. J., Brandli, L. L., Avila, L. V., Azeiteiro, U. M., Caeiro, S., & Madruga, L. R. d. R. G. (2017). Identifying and overcoming obstacles to the implementation of sustainable development at universities. *Journal of Integrative Environmental Sciences*, *14*(1), 93–108.
- Lozano, F. J., & Lozano, R. (2014). Developing the curriculum for a new Bachelor's degree in engineering for sustainable development. *Journal of Cleaner Production*, *64*, 136–146.
- Lozano, R., Ceulemans, K., Alonso-Almeida, M., Huisingh, D., Lozano, F. J., Waas, T., & Hugé, J. (2015). A review of commitment and implementation of sustainable development in higher education: Results from a worldwide survey. *Journal of Cleaner Production*, *108*, 1–18.
- Mahmud, S. N. D., & Rahman, Z. A. (2018). Education for sustainability curriculum and pedagogy in higher education institution: Using complex adaptive system as a framework. *Creative Education*, *9*(15), 2627.
- Milutinović, S., & Nikolić, V. (2014). Rethinking higher education for sustainable development in Serbia: An assessment of Copernicus charter principles in current higher education practices. *Journal of Cleaner Production*, *62*, 107–113.
- Mokski, E., Leal Filho, W., Sehnem, S., & de Andrade, J. B. S. O. (2022). Education for sustainable development in higher education institutions: An approach for effective interdisciplinarity. *International Journal of Sustainability in Higher Education*, *24*(1), 96–117.
- Müller-Christ, G., Sterling, S., van Dam-Mieras, R., Adomßent, M., Fischer, D., & Rieckmann, M. (2014). The role of campus, curriculum, and community in higher education for sustainable development: A conference report. *Journal of Cleaner Production*, *62*, 134–137.
- Şahin, M., & Aybek, E. (2019). Jamovi: An easy to use statistical software for the social scientists. *International Journal of Assessment Tools in Education*, *6*(4), 670–692.
- Sterling, S. (2004). Higher education, sustainability, and the role of systemic learning. In P. B. Corcoran & A. E. J. Wals (Eds.). *Higher education and the challenge of sustainability: Problematics, promise, and practice* (pp. 49–70). Amsterdam: Kluwer.
- UNESCO (United Nations Educational, Scientific and Cultural Organization) (2021). *Getting every school climate-ready: How countries are integrating climate change issues in education*. <https://unesdoc.unesco.org/ark:/48223/pf0000379591>.
- UNESCO (United Nations Educational, Scientific and Cultural Organization) (2022, 21 April). *What you need to know about education for sustainable development*. <https://www.unesco.org/en/education/sustainable-development/need-know>.