



# Investigating the Factors Which Impact the Integration of Sustainability Into Classroom Practice

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**Abstract.** This paper presents findings from a mixed-methods study exploring sustainability education practices in a government tertiary institution in the United Arab Emirates (UAE). Sustainability education has gained prominence as a crucial component of higher education curricula worldwide, aiming to equip students with the knowledge, skills, and values necessary to address complex sustainability challenges. Drawing on interdisciplinary research, utilizing both quantitative survey data and qualitative focus groups, this study investigates the extent to which sustainability education is integrated into tertiary curricula, examining both the barriers to implementation and the facilitators to its application. Findings indicate that while sustainability education is increasingly recognized as essential in the UAE higher education context, significant variations exist in its integration and implementation. Factors such as institutional culture, faculty attitudes, resource availability, and curricula demands, influence the extent and nature of sustainability education initiatives. Through critical analysis and practical recommendations, this study contributes to advancing the discourse on sustainability in education, offering insights and solutions to promote sustainability within education for a more viable future.

**Keywords:** Sustainability education, higher education, mixed methods, United Arab Emirates.

## 1 Introduction

Sustainability education has garnered increasing attention in tertiary institutions globally, including those in the United Arab Emirates (UAE), where the country is committed to supporting ESD (education for sustainable development) goals (Al-Naqbi & Alshannag, 2018). As the UAE continues to progress towards achieving these goals outlined in Vision 2021 and Vision 2030, integrating sustainability principles into tertiary education is now imperative: “the UAE aims to ensure that the principles of sustainable development are reflected in the curricula of all levels of secondary and tertiary education” (UAE and the 2030 Agenda for Sustainable Development, 2017, p.18).

The UAE, known for its rapid economic growth and urbanization, faces multifaceted sustainability challenges ranging from environmental degradation, rapid population growth, water scarcity and the urgent need to reduce its energy consumption; currently one of the highest in the world (Ahmad, & Jeon, 2016). Additionally, the UAE recognizes the importance of diversifying its economy and transitioning towards a knowledge-based economy, necessitating a workforce equipped with skills and knowledge aligned with sustainable development principles.

In this context, providing sustainability education in the UAE tertiary education sector plays a crucial role in preparing students to understand, address, and mitigate these challenges effectively. By integrating sustainability principles across disciplines, tertiary education institutions in the UAE can foster a culture of environmental stewardship, social responsibility, and economic resilience among students. This holistic approach to education ensures that graduates are equipped with the interdisciplinary knowledge and skills needed to contribute meaningfully to sustainable development initiatives in their respective fields.

## 2 Literature Review

The imperative to live more sustainably has become increasingly evident due to the escalating environmental and social challenges facing the planet. Governments and international bodies, including the United Nations, actively call for citizens and industry to adopt more sustainable practices. Within education, quality assurance and regulatory bodies (QAA-UK, CAA-UAE) promote and request the inclusion of sustainability in learning programs. The United Nations regards education as a crucial driver of change in fostering sustainable practices (Rieckmann, 2018). Research into HEIs (Higher Educational Institutions) shows there are efforts underway to make Sustainable Development (SD) part of the 'institutional framework' (Leal Filho, 2017).

Echoing this call for action, Levesque claims that Higher Education Institutes (HEIs) have an instrumental role in sustainable development and adopting more sustainable ways of life (2019). For Emanuel (2011), universities have a moral responsibility in promoting sustainable practices and preparing their graduates for the demands of the future workplace and society. Leal Filho et al., (2021) reiterate this idea, and with specific reference to climate change, argue that universities have an obligation to prepare the future workforce for mitigation and adaptation to climate imperatives, as this knowledge will hold significance in their professions and lives. Moreover, as industry and commerce respond to the need to become more sustainable, universities have a duty to equip graduates with skills and knowledge to find employment in the changing business landscape. Interestingly, when comparing adaptations that industry is undergoing, Herth and Stewart (2022), conveying a sense of frustration, claim that universities are exhibiting a lack of action, thus, highlighting the need for more rapid change in HEIs. Despite this perceived inadequate response by institutions, within the teaching profession itself, support for integrating sustainability into education is high. A recent study reported that over 80% of teachers view teaching sustainability as important (Will, 2023). Naturally, educators hear the call for change

but face the complex challenge of translating ‘international policies for sustainable education into classroom practice’ (Parry & Metzger, 2023).

The support to move towards sustainable practice is well established in HEIs but a major challenge relates to how stakeholders (namely campus operations and educational activity) can learn relevant skills and knowledge to integrate sustainability into operations and educational programs. It’s necessary to note that sustainability integration is not restricted to learning programs alone. For Popescu, universities need to adapt in four areas of action: 1) Teaching and Learning, 2) Research & Innovation, 3) Public / Community Service, 4) Campus Operations (Popescu, 2018). In an ideal realization, we can envisage interaction and synergy between campus operations, teaching, and other areas of practice as the institution models and practices ESD.

Helpful tools for integrating sustainability are Sustainable Development Goals (SDG), which are a frame through which industry and HEIs alike can guide their practice toward more sustainable ways of being. Another framework to support sustainability within the educational sphere is Education for Sustainable Development (ESD), which can be regarded as an accelerator or driver for the achievement of all 17 SDGs (UNESCO). Within the UAE context, to work towards meeting SDG 4 Quality Education, efforts have commenced to anchor ESD into UAE’s National Education Policy Framework (National Committee on SDGs, 2017). These tools go some way to help the integration of sustainability into learning programs. Along with identifying overarching approaches for integration, another area requiring attention in HEIs is the need to adopt curricula and pedagogic approaches that will help students develop knowledge about sustainability as it relates to their career and to society at large, with key issues including climate change and carbon neutrality (Leal et al., 2021).

Integrating ESD into an institution is a multi-level process, but at the campus level, an institution is required to discern the stakeholders’ baseline levels of SDG awareness and competence which will shape the adoption of ESD principles. Hurth and Stewart describe how, as in industry, in universities it is likely that an appetite for change will be scattered throughout the organization. Leaders should develop approaches to harness the potential within the institution to facilitate purposeful change (2022). Describing the conducive atmosphere for change, Herth and Stewart support enabling stakeholders and Agusdinata (2022) calls for a co-creation of solutions. Underpinning these requirements is the need for institutional research to identify and utilize its stakeholders and their potential to support adaptation.

Leal Filho et al (2021) notes the presence of contextual barriers to change which will need to be identified, understood and addressed. Barriers will of course vary in number, nature, force, and visibility, all of which supports the need for campus-based research. Contextual factors may facilitate or inhibit the integration of sustainability. Common obstacles for integration include a lack of resources, a lack of trained staff, a lack of institutional support, a lack of planning and a lack of information on approaches for implementation (Disterheft et al., 2015). Other factors relate to the amount of time a faculty member would have to use to initiate and see through change. Chakraborty et al (2019), refer to the ‘temporary or contractual nature of employees and limited decision-making opportunities’ which could constrain the integration of sustainability over time.

The extent of relevant teacher knowledge is a factor as the implementation of ESD is dependent on teacher skills and beliefs towards sustainability (Brandt, et al., 2019). Moreover, teacher knowledge of and attitudes towards ESD are likely to vary (Cotton et al., 2007). Variation in faculty knowledge of sustainability is another contextual factor that will shape the realization of the integration of sustainability (Serafini et al., 2022). Therefore, the capacity of any given university to adapt and achieve sustainable practice would show variance.

Within the educational context, and whether by regulatory requirements or by personal volition, many educators respond by seeking ways to integrate sustainability into their teaching practice, campus life, and the wider community. The aim of this paper is to examine the understanding and nature of this integration and to explore the push and pull factors that inhibit or facilitate this within the context of a government tertiary institution in the United Arab Emirates.

### 3 Methodology

#### 3.1 Approach

Please This interdisciplinary study utilized a mixed-methods approach, integrating a survey and focus groups. Mixed methods research integrates quantitative and qualitative data to thoroughly examine research questions, providing insights that neither method could produce alone (Creswell & Clark, 2017). Utilizing surveys for quantitative data and focus groups for qualitative data, this study aims to more comprehensively understand the research topic. Employing an explanatory sequential design, quantitative data was collected first via a survey, followed by qualitative data gleaned from three focus groups, thus enabling the gathering of in-depth qualitative data on the survey areas and a deeper exploration of emerging survey data themes. This approach allowed the qualitative analysis to clarify the findings from the quantitative phase, hence the term 'explanatory' (Toyon, 2021). The qualitative phase also served to examine and explain any outliers that may not entirely align with the quantitative results. Grounded in the interpretivist paradigm, this study recognizes the socially constructed and subjective nature of reality, considering participants' perceptions of how sustainability is integrated into higher education (Pervin & Mokhtar, 2022).

**Practicing and Sampling.** Participants (n= 144) were faculty members from a government tertiary institution situated in the UAE. They volunteered to take part in the research, representing diverse disciplines such as Business, Information Technology, Engineering, Health Science, and Applied Media. This voluntary sampling approach is a type of non-probability sampling method wherein individuals self-select to participate in the study based on their own motivations and interests (Omona, 2013). Voluntary sampling was chosen for convenience as the researchers could easily reach out to participants who were readily available and willing to participate, saving valuable time and resources. It also meant the researchers had easy access to the specific population needed. By opting to participate voluntarily, these faculty members

brought a willingness to share their unique perspectives and experiences to the research, enriching the study's depth and breadth (Gill, 2020). Participants had a range of knowledge of sustainability issues from novice to expert, with a general tendency to appear to strongly support and be engaged in the integration of sustainability.

*Reliability.* Following Popescu's (2018) categorization of four areas for integrating sustainability in Higher Education, the survey focused on two of the four areas, which were teaching and learning, and campus operations. Research & Innovation and Public/Community Service were not researched, but the related area of the relationship between sustainability and employability was explored. The survey was completed by 144 faculty members, enabling representation from all departments, albeit in varied numbers and consisted of closed, open and ranking question types, ensuring reliability through established measures.

Establishing reliability in a mixed methods study involves ensuring consistency and dependability in both the quantitative and qualitative components of the research (Zohrabi, 2013). In this study, to ensure the instruments produced consistent results a pilot survey was sent out prior to the final data collection to identify any ambiguities. Standardized procedures were followed for data collection and analysis, for example by the researchers following the same set of questions in the focus group discussions. Inter-rater reliability was adopted in the qualitative analysis phase with two coders independently analyzing the same data and assessing the level of agreement (Johnson & Onwuegbuzie, 2004). Finally, consistency or convergence of results across these two different methods strengthened the overall reliability of the study findings. By implementing these strategies, the researchers enhanced the reliability of their mixed methods study, ensuring that the findings more accurately reflect the phenomenon under investigation (Plano Clark, 2017).

## 4 Ethics

In this study ethical protocol was followed ensuring participant well-being and confidentiality. Prior approval was received from the educational institution where this study takes place. Participants were fully informed of the study's objectives, their rights, and the voluntary nature of their participation, with informed consent obtained. To protect the participants' identities pseudonyms were employed thereby assuring anonymity.

## 5 Quantitative Finding: Survey

The survey collected data on faculty experience and attitudes towards the sustainability themes of teaching and learning, campus operations and employability. The main thrust of the survey was to explore faculty perceptions of facilitating or inhibiting factors towards integration into these areas. Overall, the survey data analysis revealed a strong consensus among participants regarding the importance of sustainability

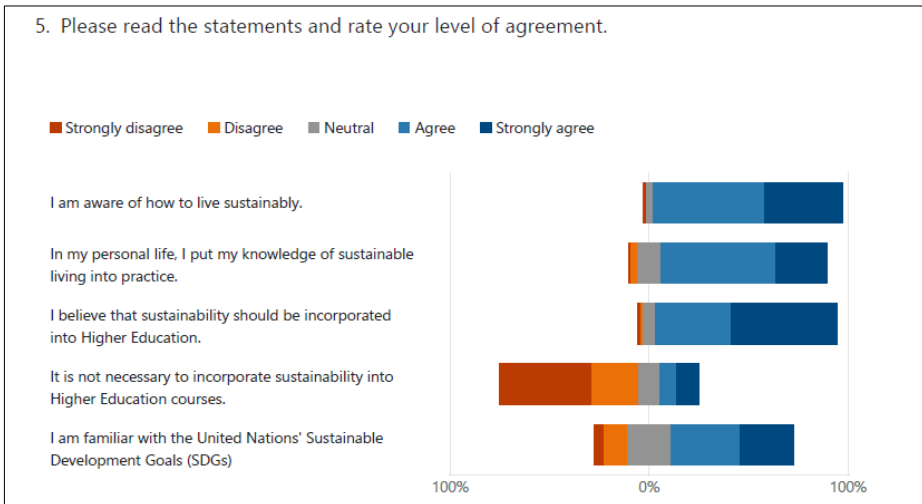
education across disciplines. Participants from various divisions, including Engineering, Information Technology, Business, and Health Science, expressed support for integrating sustainability into their curricula, indicating high levels of awareness and interest in sustainability issues. Thematic analysis of open-ended responses highlighted key themes, such as the need for continuous improvement in specific sustainability practices and policies at the campus level, as well as a perceived relevance to future career prospects. Furthermore, the data provided additional insights into participants' perspectives on sustainability education with common themes emerging which mirrored the focus group discussions, thereby corroborating the findings. These findings aim to address the study's research questions:

*To what extent is sustainability education integrated into curricula in a government tertiary institution in the UAE?*

*What are the barriers and the facilitators to the implementation of sustainability education in a government tertiary institution in the UAE?*

### 5.1 Respondents Beliefs Regarding Sustainability

The survey findings illustrate respondents' beliefs regarding sustainability, as summarized in Figure 1 below:

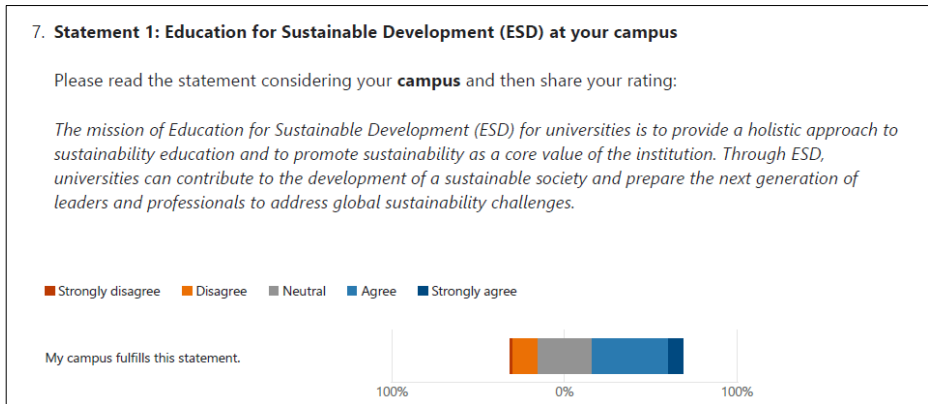


**Fig. 1.** Respondents' beliefs regarding sustainability

Figure 1 indicates that most respondents are aware of sustainable living practices and actively implement them in their personal lives. Additionally, there is strong support for integrating sustainability into higher education, with a widespread familiarity with the United Nations' Sustainable Development Goals (SDGs) among participants. Further comments from respondents regarding their beliefs point to the following key findings:

- The majority of respondents are aware of sustainable living practices.
- Many respondents actively implement sustainability in their personal lives.
- There is a strong belief among respondents in integrating sustainability into higher education.
- Familiarity with the United Nations' SDGs is prevalent among the participants.

**Education for Sustainable Development (ESD) at Your Campus.** Approximately 54% of respondents believe their campus fulfills the mission of Education for Sustainable Development (ESD) as illustrated in Figure 2 below:



**Fig. 2.** Education for Sustainable Development (ESD) at your campus

However, further comments from respondents highlighted areas for improvement, particularly regarding waste management practices and unsustainable behaviors such as excessive energy consumption. Suggestions were made to address these issues, including reducing the use of disposable items on campus. Further investigation is needed to more fully understand the divergence. One possible avenue to explore would be whether faculty understanding of ESD excludes campus operations.

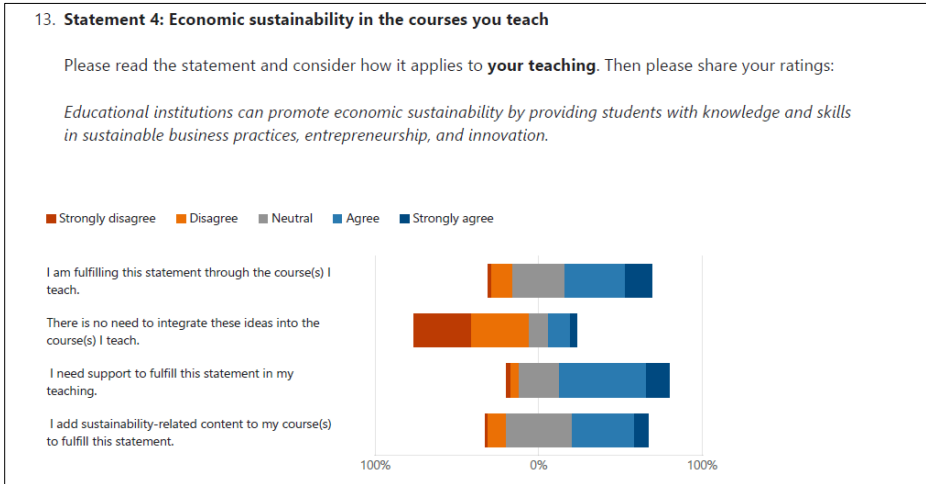
Areas for Improvement:

- Issues with waste management practices were highlighted.
- Suggestions for reducing the use of disposable items on campus were made.
- Specific instances of unsustainable practices, such as excessive energy consumption, need addressing.

Need for Continuous Improvement:

- There is a notable need for continuous improvement in specific sustainability practices and policies at the campus level.

*Economic Sustainability in the Courses You Teach.* The majority of respondents expressed awareness of the importance of environmental sustainability in their courses as illustrated in Figure 3 below:



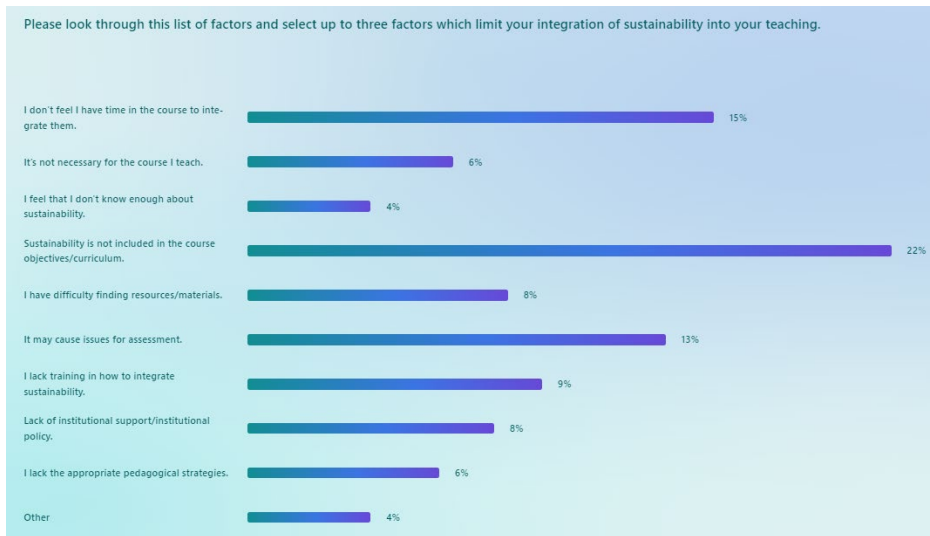
**Fig. 3.** Economic sustainability in the courses you teach

Many respondents indicated that they integrate sustainability concepts into their teaching to some extent. Further comments by respondents about the statement point to key findings suggesting that while there's a recognition of the importance of economic sustainability in teaching, there is also a need for support and resources to further integrate sustainability into course content effectively.

*Factors Limiting Integration of Sustainability into Teaching.* As depicted in Figure 4 below, challenges in integrating sustainability into teaching are multifaceted and encompass various aspects:

- **Absence of sustainability from course objectives:** Some educators face difficulties in incorporating sustainability into their courses due to a lack of alignment with established course objectives.
- **Resource constraints:** Factors such as lack of time, institutional support, and training pose significant challenges to educators seeking to integrate sustainability effectively into their teaching practices.
- **Assessment alignment concerns:** Educators also express concerns about aligning assessments with sustainability learning outcomes, highlighting the need for clearer assessment criteria and guidelines.

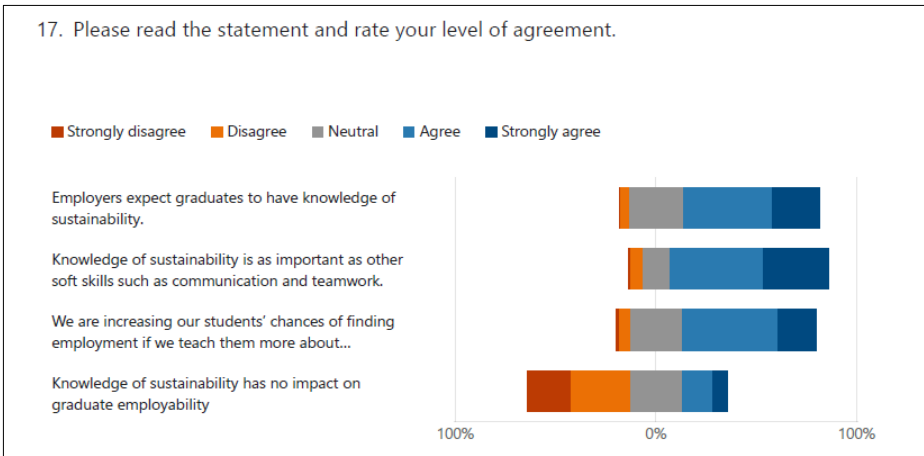
These findings underscore the complex nature of challenges facing educators in integrating sustainability into higher education courses. From structural and resource-related constraints to issues pertaining to faculty expertise, addressing these challenges requires a comprehensive approach that considers diverse factors influencing teaching practices.



**Fig. 4.** Factors Limiting Integration of Sustainability into Teaching

*In What Ways can HCT Support Faculty to Integrate Sustainability.* In response to the open-ended question on how HCT can support faculty in integrating sustainability into their teaching, respondents provided key suggestions that revolve around four main themes. Firstly, there's a call for offering training sessions on sustainability integration to equip faculty with the necessary skills. Secondly, respondents advocate for revising the curriculum to embed sustainability content into existing courses. Thirdly, there's a need to allocate resources, including funding and time, to support sustainability initiatives and curriculum development. Lastly, respondents stress the importance of establishing institutional policies prioritizing sustainability in education. These suggestions underscore the importance of proactive measures in integrating sustainability into higher education.

*Impact of Sustainability Knowledge on Graduate Employability.* In On the question about impact of sustainability knowledge of graduate employability, Figure 5 below illustrates that there is a general agreement that employers expect graduates to have knowledge of sustainability, and that such knowledge is as important as other soft skills. Most respondents believe that increasing students' knowledge of sustainability enhances their chances of finding employment.



**Fig. 5.** Impact on Graduate Employability

*Summary of Quantitative Findings.* In summary, the survey responses reflect a widespread acknowledgment of the significance of sustainability in higher education, albeit with varying degrees of integration observed among faculty members. Respondents highlighted a clear need for support in integrating sustainability into their teaching practices, emphasizing the importance of workshops, clear orientation materials, and increased flexibility in course development. Additionally, suggestions for support encompassed curriculum integration, training initiatives, and institutional policy changes. However, respondents also identified common challenges, including time constraints, lack of institutional support, and insufficient training in sustainability integration. Addressing these challenges and implementing the suggested support measures are crucial steps towards enhancing sustainability education in higher education institutions

## 6 Qualitative Findings: Focus Group

Following the survey, focus groups were conducted to delve deeper into the survey responses, providing qualitative insights and context and complementing the survey data by offering a richer understanding of participants' perspectives. Focus group participants within this HEI setting comprised of faculty volunteers from a range of academic departments (Business, Health Sciences, Engineering, Computer Information Science, General Academic Requirements). Focus group data was analyzed to identify emergent themes.

To analyze the qualitative data collected from the focus groups, a systematic coding process was conducted, leaning on the coding framework of Carpendale et al., (2017). Initially, the focus group discussions were auto transcribed and then read through while re-listening to the recording to ensure accuracy and completeness of the data. Following transcription, a preliminary review of the transcripts was conducted to

familiarize with the content and identify initial patterns/themes that related to integrating sustainability into practice. This stage was followed by an open coding method, whereby emergent themes and concepts were highlighted and labeled. These codes were then categorized into broader themes within integrating sustainability into practice.

To ensure reliability and validity, a second round of coding was performed by other research team members to evaluate the strength of the codes, themes and categories. At this stage, weaknesses and discrepancies were discussed and resolved through reaching a consensus on whether to continue with, alter, or abandon the particular theme/category. This thematic analysis allowed for the extraction of significant insights and the development of a comprehensive understanding of the perspectives of the focus group participants. To illustrate the themes that emerged from the focus groups, representative quotes from faculty members were selected and are presented in the section below.

Prominent themes which emerged from the focus groups which will be examined in this paper include:

- The perceived impact of individual commitment and self-initiatives
- The need for structured integration
- The need for teacher training

## 6.1 Individual Commitment and Self-Initiatives

In the face of mounting environmental crises, the role of education in fostering sustainability has never been more critical. However, the successful integration of sustainability into education hinges upon the dedication of individuals and the proactive initiatives of faculty members (Evans, Whitehouse, & Gooch, 2012).

The focus group discussions revealed several examples where educators demonstrated a personal dedication to sustainability despite, at times, institutional constraints. For instance, Dr. Brown, an English language instructor, expressed their desire to integrate sustainability themes into courses, emphasizing the need to align course outcomes with sustainability goals (Hill, & Wang, 2018).

Furthermore, Participant 2, an engineering faculty member, highlighted the challenges faced in integrating sustainability due to resource constraints. Despite these challenges (e.g time, funding and training) Participant 2 emphasized the importance of securing funding for essential equipment to enhance sustainability education in engineering programs (Lee, 2000).

*So when we speak about engineering, we are speaking about hands-on instruments, measurements. We asked many times about some equipment and components to be able to... integrate sustainability in our courses. [In the end we used] the simple components by ourselves to be able to join [COP 28] and we did a great job with our students, but if we had at this time these specific components we asked for we will be able to do more advanced projects.....to have a great sustainability in our engineering courses understood.*

Another point that emerged from the focus groups was a proposal by faculty for the establishment of focus groups within academic divisions to strategize and plan for the integration of sustainability across courses and programs. This initiative reflects faculty members' proactive engagement in curriculum development and pedagogical innovation, driving systemic change to embed sustainability principles within the fabric of the institution (Lozano et al., 2013).

*Well, in my opinion...we could have focus groups in each division and they can choose the course contents or update the courses according to the integration [of sustainability] needs. I mean how the sustainability could be integrated into those courses (Participant 8).*

The need for action to be driven by leadership decision is exemplified by Participant 5 who mentioned that through her leadership and curriculum development role she was able to take the initiative by incorporating sustainability into the Innovation and Entrepreneurship curriculum.

*I'm heavily involved with the Innovation and Entrepreneurship education program that every student needs to embark in, and over the last three years, Sustainable Development Goals was linked within their particular startup (Participant 5).*

The examples above illustrate how individual educators recognize the importance of sustainability and take proactive steps to incorporate it into their teaching, even within disciplines traditionally perceived as unrelated to sustainability. This underscores how individual commitment drives the push for institutional support and resource allocation, essential for embedding sustainability across diverse academic disciplines.

Individual commitment also extends beyond classroom activities to encompass personal lifestyle choices and behaviors (Corcoran & Wals, 2004). In this capacity educators serve as role models for students, demonstrating sustainable practices in their daily lives and fostering a culture of environmental stewardship. Participant 3 mentioned incorporating sustainability topics into classroom discussions and encouraging students to reflect on their consumption patterns and environmental impact. By modeling sustainable behaviors, educators empower students to adopt eco-friendly practices and contribute to a more sustainable future (Vukelić & Rončević, 2021). Participant 4 reiterates this point:

*I try to raise awareness about sustainability by discussing current events like COP 28 and by demonstrating sustainable practices in my own life and sharing them with my students. However, when I ask students about their awareness and care for sustainability, most of them seem unaware and indifferent. While they initially express concern, their actions, such as taking long showers and leaving the water running, suggest otherwise.*

In conclusion, there is significant evidence to demonstrate that faculty-led initiatives are essential drivers of change in sustainability education, empowering educators to lead by example and catalyze institutional transformation (Askell-Williams & Koh, 2020). Through advocacy, innovation, instructional change, collaboration, and positive faculty modeling, faculty play a central role in embedding sustainability principles into the core mission of educational institutions, preparing students to address pressing environmental challenges.

**Program structure and integrating sustainability.** A prominent focus group theme was the perceived limits of individual initiatives, compared with a strategic integration of sustainability involving key academic/faculty roles. Individual initiatives, although praiseworthy, by their nature were perceived to have a lower likelihood of being widely adopted and repeated within the institution, in contrast to a structural change in a course. And this perception is reflected by Leal in that ongoing change is less likely if it depends on ‘a few key and committed staff’ (Leal Filho et al, 2018). Faculty are one of the ‘principal contributors’ to the integration of sustainability (Chakraborty et al., 2019) but it appears that their efforts alone are not sufficient for lasting change.

In the discussion of the limitations of individual initiatives, several focus group participants stressed the desirability of the involvement of pivotal roles in academic programs to support integration of sustainability. The key roles in this research context were APC (Academic Program Coordinator) and SCTL (System Course Team Leader) These roles hold responsibility for management of courses, from shaping course learning objectives (CLOs), learning outcomes (LOs), item creation, assessment strategy, and course content.

With these roles being key drivers or facilitators of course amendments, their availability and involvement can prove decisive in the integration and degree of integration of sustainability into a course. Commenting on individual initiatives organized outside the course management structure, one faculty member stated:

*then maybe it's not repeated or you're doing is just because you care about sustainability, while if it's integrated into the course from with designing the course, it's different, like everybody that is teaching their classes to cover it (P9)*

Referring to the necessary involvement of the SCTL, who is regarded internally as a subject specialist, one participant (P1) showed who they felt was responsible for the integration of sustainability: ‘You get the point that he is specializing one in this part, so I would like to see him be able to do this part’ (P1)

Key role involvement was recognized as a facilitating factor; however, key role involvement was not always possible. One participant also mentioned how SCTL involvement in integration, and in training for integration, was affected by the workload of the SCTL:

*So we have to start with the SCTL. Unfortunately, the SCTL is all the time busy. Everyone in engineering and the SCTL all busy, busy, busy, busy. So this is the point. I tried to push him to be with us in the last training, but unfortunately, he didn't need to join us for this part. So I would like to speak with him more time. To be able to start with this part since as I mentioned renewable energy system, it will come as a part of main part of sustainability.*

The discussion revealed examples where faculty had worked or were working on integrating sustainability into courses and had established a team and method format which supported integration. One participant working on integrating sustainability into his courses, and who had attended a training course that focused on integrating sustainability into the curriculum, described the process through a teamwork frame.

*We have the SDGs plus their associated KPI as well. And that actually guides us how to integrate it, but again, it's a kind of teamwork. the SCTL, APC and sometimes the core team members we sit together (P1).*

Acknowledging the key role involvement in integration, one faculty member described how the task of integration of sustainability could be merged into the existing SCTL role and duties, which, if possible, could create an ongoing opportunity for integration: “APC and SCTLs need to add it while they are doing the other changes that they do” (P9)

Making sustainability integration part of the SCTL role could go some way to addressing the shortcomings of individual initiatives and of SCTL unavailability for integration projects but could possibly exacerbate workload imbalances. The quoted faculty member is a strong proponent of the integration of sustainability into all areas of campus activity, both academic and non-academic. For them, sustainability should be visible in the “common practices of the whole institution” (P?) as well as course related.

This view of integrating sustainability into existing practices was not isolated and was a visible theme in the open-ended survey items. Several participants shared the view that integration of sustainability should be campus-wide, including campus operations, such as waste generation and collection, as well as on the cognitive level, seeking change to student and faculty values. serves to introduce the need to further research faculty views of holistic integration (Leal Filho, 2017) and to explore the potential issues of a restricted view of integration of sustainability (Greenwashing).

*Training for Integration.* The support for integrating sustainability into teaching is high, as noted earlier. However, the findings suggest that putting this support into practice is dependent on a range of factors. One such factor that emerged in the focus groups was the need for training in the areas of what to integrate and how to integrate. Teacher training is a necessary component of HEIs path towards sustainability (Expósito & Sanchez, 2020) which can be provided internally or externally to meet to serve a range of foci within embedding ESD into practice.

Amongst other areas, training courses focus on theoretical approaches and a commensurate methodology for the integration of sustainability (Expósito & Sanchez, 2020) and focus group participants highlighted the need to establish what the most appropriate methods would be to integrate sustainability: “We need to involve teachers in different PD's, in different, in different training to understand. That understand sustainability, how it's impacted our business, how is it related” (P6).

It is necessary to remember there is no agreed or uniform understanding of what sustainability means or defines. Participant understandings of what sustainability means or comprises were not sought in the research, but other research suggests variation (Vikane, & Høydalsvik, 2023). It follows that an educator's particular understanding of what sustainability comprises would underpin what content would be integrated into a program of study (Waltner et. al., 2020). P7 reflects recognition of the variation in sustainability knowledge:

*When we talk about how to incorporate it, I believe that we need to consider also raising awareness among faculty as well, not only students, because faculty, they are not all of them at the same level of awareness in relation to sustainability (P7)*

As noted above, one method visible from the focus groups was the incorporation of SDGs into existing courses. The participant mentioned above attended a UNESCO ESD Bootcamp in Fall 2023 (with 10 other faculty members) and was working on integrating SDGs into one his courses at the time. The Bootcamp offers training on ESD methodology with one of the organizing principles being SDGs. Therefore, it appeared that the training had provided a methodology that facilitated the integration of SDGs into courses.

## **7 Further Study**

Exploring sustainability integration within higher education institutions presents avenues for future research to deepen our understanding and improve educational practices and develop the work done in this research study. One significant area for investigation involves examining the impact of faculty-led initiatives on sustainability integration, particularly in disciplines traditionally less associated with sustainability. While we know faculty undertake their own sustainability initiatives, as evidenced in the findings here, there is little research on the impact and influence of these. Understanding how individual commitment influences institutional change could provide insights into fostering a culture of sustainability across all departments. Additionally, future studies could explore both the development of and effectiveness of faculty training programs focused on integrating sustainability into the curriculum, with the aim of empowering educators to incorporate sustainability principles into their teaching practices. By addressing these research gaps, academics can contribute to the

ongoing improvement of sustainability education in higher education institutions, both in the UAE and globally.

## 8 Discussion and Conclusion

Exploring Incorporating sustainability education into higher education is vital globally, especially in the United Arab Emirates (UAE), where the UAE government aims to align with international sustainability goals (Al-Naqbi & Alshannag, 2018). This study explored how well sustainability is integrated into teaching at a UAE government tertiary institution and the factors which helped or hindered this integration.

Faculty members generally agreed on the importance of teaching sustainability across different subjects. Many expressed an interest in integrating sustainability into their courses, but the extent of this varied due to factors like institutional culture, faculty attitudes, and available resources (Al-Naqbi & Alshannag, 2018). While there's enthusiasm for sustainability, practical challenges such as limited resources, time constraints, course demands, and the need for training make integration efforts limited. Overcoming these challenges requires institutional support and clearer guidance on how to integrate sustainability into teaching.

Despite challenges, some factors appear to have facilitated a limited integration of sustainability in some courses. Individual commitment and proactive efforts from faculty members played a crucial role (Al-Naqbi & Alshannag, 2018). Faculty members took initiatives such as, including sustainability topics in their courses and advocating for curriculum changes. However, there are perceived limitations of individual initiatives for breadth and longevity of integration. A key factor of integration was the involvement from key academic roles, like program coordinators and course leaders, supported integration efforts, whose inclusion shapes integration.

To enhance sustainability integration, institutions need to invest in faculty training (such as the aforementioned UNESCO Bootcamp), provide more resources (workload and funding related), and offer clearer guidance on integrating sustainability into teaching (Lee, 2000). Curriculum changes should prioritize sustainability across subjects and align with global sustainability goals like the UN's Sustainable Development Goals (SDGs). Moreover, there is a clear view that sustainability should ideally be integrated into all areas of everyday activity; both academic and operational, supported by a value change. Additionally, institutional policies should encourage and reward sustainability integration efforts by faculty.

Finally, this study explored the impact of sustainability education on graduate employability with the aim of enhancing graduate employability by preparing graduates who are ready to address pressing environmental challenges, aligning with the UN's Sustainable Development Goals (Al-Naqbi & Alshannag, 2018). The study found that integrating sustainability into tertiary curricula prepares students to understand and mitigate sustainability challenges effectively. Graduates equipped with interdisciplinary knowledge and skills are better positioned to contribute meaningfully to sustainable development initiatives in their respective fields (Strachan et al., 2023). This

holistic approach ensures graduates are prepared to address real-world sustainability issues, enhancing their attractiveness to employers.

This study highlights the importance of sustainability integration in higher education and the challenges involved. By addressing barriers and leveraging facilitators, institutions can better prepare students to tackle sustainability challenges (Al-Naqbi & Alshannag, 2018). Moving forward, collaborative efforts from institutional leaders, faculty members, and policymakers are essential to make sustainability education a core part of higher education in the UAE and globally.

In conclusion, this study underscores the multidimensional nature of sustainability integration within higher education, extending beyond curricular initiatives. Popescu's (2018) framework highlights four essential areas for institutional adaptation, emphasizing the interconnectedness of teaching, research, community service, and campus operations. The survey findings corroborate the importance of sustainability across disciplines, with faculty expressing strong support for integration efforts. However, challenges persist, including resource constraints and alignment issues. Qualitative insights from the focus groups reveal the pivotal role of individual commitment, structural integration, and targeted training in fostering sustainability education, echoing the findings of Expósito & Sánchez (2020). Addressing these multifaceted challenges necessitates a holistic approach, integrating sustainability principles into institutional practices and pedagogical strategies to prepare students for a sustainable future.

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