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Generation Z, sustainability orientation and higher education implications: An ecopedagogical conceptual framework

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Keywords

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Abstract

Generation Zs (hereafter Gen Zs) are the new generation of adults entering the workforce and becoming key stakeholders and leaders in the new century. Relatedly, this is also the generation posited to reorient the paradigm in business, leadership, and governance back towards stronger sustainable development agendas. Consequently, exploring the sustainability orientations and educational outcomes of the evolving Gen Z cohort is beneficial. Whilst there has been significant extant discourse on various research dimensions concerning the preceding generations (e.g., Gen Y/Millennials, Gen X and Boomers), research on the Gen Zs is at a nascent stage. Specifically, there has been no known study to date exploring the collective thematic dimensions of (1) ecopedagogy and sustainability education, (2) Gen Z generational characteristics and perceptions, and (3) governmental and institutional policy implications in higher education. This paper is conceptual in nature and aims to critically review the literature characterising Gen Zs and advance the conceptual and contextual understanding of this generational cohort within the above thematic dimensions. An ecopedagogical conceptual framework is also developed and proposed for further empirical research.

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Introduction

As the globe, communities and humanity grapple with the quandaries of the global health pandemic, climate change, rising social inequalities and growing economic uncertainties, the debates surrounding sustainability, sustainable development and sustainability education have escalated in tandem. Consequently, the role of higher education in advancing and facilitating sustainable development and sustainability agendas and its associated concerns have received increased attention in contemporary educational discourse (Sandri, 2022; Shephard & Furnari, 2013; Singh & Segatto, 2019; Ryan et al., 2010; Wamsler, 2020). For the purpose of this study, we consider the terms sustainable development, sustainability and its taxonomical variations under the label of sustainability. As Ryan et al. (2010) suggest, the adoption of an inclusive 'sustainability' term underpins its conceptualisation as a heuristic learning process and one which triggers variable and contested meanings. Moreover, Sandri (2022) advises that by reflecting on key educational systems educating the future generations of professionals and citizens, sustainability education (and education *for* sustainability) aims to influence change in individual values, paradigms and educational practices based upon core sustainability principles. The literature review and discussion in the subsequent sections of the paper support this supposition. Concurrent with the heightened focus on sustainability education, the academic discourse relating to Gen Zs has also increased (Mahapatra et al., 2022; Rickes, 2016). As such, this generational cohort and their sustainability consciousness will be the subject of inquiry in this study.

Born in 1995 or later, Gen Zs are the new generation of adults entering the workforce and becoming leaders in the new century (Dobrowolski et al., 2022; Haddouche & Salomone, 2018; Priporas et al., 2017; Francis & Hoefel, 2018; Wiedmer, 2015). This is the next generation that will shift the paradigm in business, leadership, and governance. They are also the generational cohort portraying vigorous expectations of environmentalism and climate change agendas (Bloyd Null et al., 2021). A preliminary review of extant discourse on the Gen Zs indicates that they are: (1) true digital natives adaptive to technological innovations and social disruptions; (2) environmentally aware and advocate ethical consumption; (3) actively participative and outspoken about social movements, diversity and rights of the individual; (4) future leaders developing and implement policies, including sustainability; and (5) the generation bearing the brunt of the global socio-economic challenges accumulated from decades of economic decline and the current global pandemic (Dabija et al., 2019; Dobrowolski et al., 2022; Francis & Hoefel, 2018; Horner & Khor, 2021; Kaplan, 2020). The above considerations, therefore, inform the development of this study and its focus.

Gen Zs, the next generation of leaders in business and government, are posited to play a vital role in forwarding and reorienting the global sustainability agendas for the future. While there may be diverse opinions, perceptions and degrees of tensions pertaining to sustainability concerns, extant research indicates that Gen Zs are increasingly receptive toward sustainability-oriented business models

and the pursuit of sustainability and environmentalism (Bloyd Null et al., 2021; Dabija et al., 2019; Horner & Khor, 2021). We acknowledge that when it comes to an individual's sustainability orientation, there are a myriad of impacting factors beyond age (e.g., geographical location, nationality, social class, gender, culture, ethnicity, etc.). With this in mind, we recognise that the nuances and observations articulated in this study are statements of tendency rather than generalisation and may not equally apply to all Gen Z cohorts around the world. Nonetheless, these statements of tendency do support increasing verifications in recent extant research highlighting the stronger inclinations of Gen Zs toward environmental concerns, green consumerism, social responsibility and sustainability actions compared to previous generational cohorts (Dabija et al., 2019). Consequently, exploring the sustainability orientations and educational outcomes of the evolving Gen Z cohort is beneficial.

Whilst there has been significant extant discourse on various research dimensions concerning the preceding generations (e.g., Gen Y/Millennials, Gen X and Boomers), research on the Gen Zs is at a nascent stage (Chillakuri, 2020; Karabay et al., 2022). Specifically, there has been no known study to date exploring the collective thematic dimensions of (1) ecopedagogy and sustainability education, (2) Gen Z generational characteristics and perceptions, and (3) governmental and institutional policy implications in higher education. This conceptualisation is valuable as extant research indicates the need for greater interdisciplinary discourse and investigation of sustainability in higher education within an integrated approach to address sustainability disciplinary concerns, curricula and policies (Fisher & McAdams, 2015; Liu et al., 2022). Particularly, there is a paucity of research exploring sustainability education within the theoretical focus of Gen Z cohorts in higher education. This paper is conceptual in nature and aims to critically review the literature characterising Gen Zs and advance the conceptual and contextual understanding of this generational cohort within the above thematic dimensions. An ecopedagogical conceptual framework for sustainability education of Gen Zs in higher education is also developed and proposed for further empirical research.

Literature review

Ecopedagogy for our common future: Sustainability in higher education

The first thematic dimension proposed in constructing an ecopedagogical conceptual framework for sustainability education of Gen Zs in higher education is education for sustainability. There has been heightened extant discourse in academia and industry about sustainability agendas within higher education. In the past three and a half decades since the Brundtland Report "Our Common Future" and its conceptualisation of sustainable development, there has been considerable expansion in the thematic dimensions defining sustainability (Fisher & McAdams, 2015; Khalil et al., 2021; Korsant, 2022; Shephard & Furnari, 2013). Correspondingly, there has been increased rhetoric relating to its implications, challenges and applications in higher

education (Ryan et al., 2010; Shephard, 2008; Singh & Segatto, 2019; Wamsler, 2020). Concurrently, sustainability agendas in the workplace, industry and policymaking have also gained prominence. As Sandri (2022) suggests, incorporating learning for sustainability into higher education is essential if contemporary socio-ecological challenges (e.g., climate change, social inequities, unsustainable growth) are to be adequately addressed. As such, the author observes the pivotal decision by institutions of higher learning to include a sustainability curriculum within learning and teaching practice and degree programs. While the notion of sustainability in higher education is not a recent phenomenon, the teaching and/or curriculum development intentions and strategies are incredibly diverse (Shephard & Furnari, 2013). Cotton et al. (2009) posit that this diversity of understanding about education for sustainability imposes constraints that include but are not limited to: (1) lack of academic and policy leadership, (2) perceived incongruence or limited relevance, (3) inappropriate dominant pedagogies, and (4) competing and/or conflicting agendas.

With the growing concerns about the global environmental crisis and widespread economic inequalities arising from globalisation, the UN general assembly adopted the document "Transforming our world: the 2030 agenda for sustainable development" in 2015 (United Nations, 2015). This agenda and its 17 Sustainable Development Goals (the UNSDGs) have now been adopted by governments and institutions across the world and require larger stakeholder collaboration to be successfully implemented (Aleixo et al., 2020; Liu et al., 2022). The UNSDGs underscore the premise that environmental and social issues must be addressed together rather than separately. In this regard, Misiaszek (2018) posits the connections and juxtapositions between critical sustainability education and global environmental and social (in)justice. Correspondingly, Shephard (2008) recommends the value of curriculum changes to embed education for sustainability principles into core learning outcomes so that students may: (1) be aware of sustainability issues, (2) have the skills and desire to act sustainably, and (3) demonstrate the emotional and personal attributes to behave sustainably. Thus, more holistic pedagogies are critically needed to address the globe's contemporary challenges since sound sustainability education is seen as a powerful (and proven) tool, both as an end and a means, as expressed in the UNSDGs (Wamsler, 2020). Whilst a comprehensive critical discussion of the UNSDGs and their implications in higher education is beyond the scope of this paper, it is important to acknowledge its implications and contributions toward the evolution of education for sustainability agendas and efforts.

An individual's perceptions of, and orientations towards, sustainability (and related socio-environmental concerns) impact how they perceive the concept, its contributing effects and potential solutions to address concerns, including attributions of responsibilities. This perception and sustainability orientation are, in turn, rooted in their educational, disciplinary and learning experiences with these issues (Fisher & McAdams, 2015). In this respect, Wamsler (2019) suggests that there is a predominance of sustainability education focused on the external dimensions of the biological ecosystems, socio-economic structures,

and technological and governance dynamics, neglecting the critical internal dimensions of the individual. Intrinsically, an individual's interpretation of the perceived relevance of sustainability education within the curriculum is defined through the lens of their own personal values and beliefs (Cotton, 2009). As such, extant sustainability education research in recent years has increasingly advocated that sustainability education must progress beyond education about sustainability (focused on knowledge) to education *for* sustainability (focused on values, perceptions and attitudinal dispositions) (Shephard & Furnari, 2013; Singh & Segatto, 2020; Wamsler, 2019). Correspondingly, there is a need for a stronger focus on educational pedagogy within sustainability education, wherein the students' capabilities are developed to adequately respond to the socio-environmental 'wicked problems' of our contemporary world and adequately aligned to practice within desired learning outcomes (Sandri, 2022). As such, Misiaszek (2018) advocates the consideration of ecopedagogical models of education for sustainability, wherein the socio-environmental concerns affecting our globally connected world are critically, reflectively and holistically debated.

Ecopedagogy evolved from the preceding environmental pedagogies and is rooted in Freire's critical pedagogy principles in which transformation-based teaching models are adopted to dialectically reflect and critically analyse problems and/or issues under debate (Kahn, 2008; Korsant, 2022; Misiaszek, 2018; Misiaszek, 2020). As Misiaszek (2020) highlights, ecopedagogical learning and teaching are pluralistic and complex in their foci, wherein problem-posing, authentic democratic dialogue, praxis-based learning outcomes, and safe spaces for conflict-based discourse are encouraged and supported. Whilst still a nascent and contested movement in higher education discourse, ecopedagogical strategies do represent a consequential evolution of critical pedagogies towards a more humanistic, socially-just and future-oriented ecological agenda based on sustainability and planetary considerations (Kahn, 2008). Within this context, this study supports the value of exploring Gen Z's (also known as the sustainability generation) (Petro, 2021) sustainability orientations and education outcomes. As a significant stakeholder cohort, it is vital to investigate the self-perspectives, awareness and advocacy inclinations of Gen Zs toward global environmental, societal, and economic concerns. As highlighted by Horner and Khor (2021) and Thorne (2015), concerns about unrestrained exploitation of the environment, prolonged unsustainable socio-economic impacts, and the unprecedented challenges from the global COVID-19 pandemic have triggered renewed calls from current generational stakeholders for a return to more robust sustainability education agendas. The next section discusses these concerns from the lens of the sustainability generation, the Gen Zs.

Gen Zs: Rise of the sustainability generation

This section discusses the second thematic dimension of focus within the study – the Gen Zs and their perceived sustainability orientations. Environmental concerns have become imperative for most organisations, who are increasingly expected to act with environmental

consciousness and encourage consumers to embrace a more sustainable lifestyle that largely includes sustainable consumption (Su et al., 2019). As highlighted in the preceding sections, Gen Zs are inheriting significant sustainability, climate change and socio-economic challenges compared to their predecessors. Therefore, as they are the generational cohort more inclined towards sustainability concerns and agendas, there are opportunities for organisations to better connect with this generational cohort of consumers through their sustainability practices and value perceptions (Dabija et al., 2019; Dai & Chen, 2021; Dobrowolski et al., 2022; Giachino et al., 2021; Homer & Khor, 2021). Gen Zs, also referred to as the Gen Zers, iGen, post-Millennials or Zoomers, are individuals born in 1995 or later (Haddouche & Salomone, 2018; Priporas et al., 2017; Thangavel et al., 2021; Twenge, 2017). Due to their early exposure and experiences with healthy lifestyle choices, Gen Zs are more concerned and knowledgeable about sustainable living than previous generations (Su et al., 2019). This generational cohort tends to be eco-friendlier than previous generational cohorts, demonstrating greater concerns about the environment, prioritising health and wellbeing in consumption decision-making, and seeking a higher quality of life. As Dai and Chen (2021) observe, Gen Zs' environmental values, attitudes and behavioural intentions are significant because they consider such sustainability concerns personally relevant and important. Consequently, such perceptions and behaviours influence their relationships with brands and consumption intentions, wherein consumption is viewed as: (1) an expression of individual identity, (2) access rather than possession, and (3) a matter of ethical concern (Francis & Hoefel, 2018). Accordingly, Gen Zs are considered more influential than their preceding generations in redefining contemporary production and consumption (Priporas et al., 2017). Therefore, organisations must rethink and reorient toward a more personalised, ethical and authentic way of conducting business (Fromm, 2018; Thangavel et al., 2022). In fact, recent studies (Francis & Hoefel, 2018; Kaplan, 2020; Mahapatra et al., 2022; Sakdiyakorn et al., 2021) have referred to the Gen Zs as the 'True/Truth Gen', wherein their individual values, expressions and belief systems are anchored to one core dimension – the search for truth.

Amongst the different generational cohorts, Gen Zs will become the largest consumer base. Hence, there has been a growing interest in academia and industry to understand their needs, their attitudes toward the environment and their purchasing behaviour. Fromm (2018) estimates that Gen Zs may contribute approximately US\$143 billion in purchasing power, becoming the largest share of the consumer market. Additionally, they are also emerging as the sustainability generation, driving the sustainability revolution (Petro, 2021). Gen Zs demonstrate the greatest concern for the planet's wellbeing compared to preceding generations and actively influence others to make sustainability-first buying decisions (Giachino et al., 2021; Horner & Khor, 2021; Yildiz & Kelleci, 2022). As per Kastenholz (2021), 79 per cent of Gen Zs articulated a desire to see companies adopt socially responsible practices and safeguard the wellbeing of their employees, consumers, and the broader community.

Moreover, there has been a progressive movement towards an 'environmental imperative', wherein businesses are

compelled to proactively demonstrate accountability, ethical responsibility and sustainability-centric innovations to address contemporary socio-environmental concerns (Jain et al., 2021). Recent extant research on the Gen Zs also posits that they are the first true 'digital natives' and are also colloquially known as the TikTok generation, who have evolved in a hyper-connected world, live ubiquitously in a global digital playing field, and typically favour virtual means of communication (Haddouche & Salomone, 2018; Francis & Hoefel, 2018; Mahapatra et al., 2022). Most Gen Zs, now in their mid-20s, are generally well-educated, tech-savvy and accustomed to making informed purchasing decisions (Francis & Hoefel, 2018). Arguably, as we have previously acknowledged, we recognise that not all Gen Zs are identical and that there are distinct variations in the nuances and preferences of individual Gen Z behaviours. Nonetheless, the extant literature reviewed in this study does support the above statements of tendency articulated. Relatedly, businesses are beginning to adopt sustainable practices not only to protect the environment but to keep up with the market changes and demands brought on by the more socially conscious Gen Z consumers. They are the consumers most likely to make consumption decisions based on personal sustainability values and principles (Petro, 2021). As Su et al. (2019) suggest, sustainability and environmental concerns are today no longer limited to a minority of environmental advocacy groups. Consumers today are demonstrating increasingly greater environmental consciousness and genuine anxieties about the world's socio-ecological predicaments.

There is also a need to consider the barriers to adopting sustainability-first consumption behaviour. With regard to Gen Z consumption behaviour and intentions, the literature suggests that there are various barriers preventing consumers from buying environmentally friendly products. In this regard, Činčera et al. (2014) observe a potential lack of trust in debates surrounding sustainable consumption and posit the influence of consumers' personal histories and consumption experiences in consumer decision-making. More precisely, the authors posit that amongst the respondent segments investigated, only mothers and Gen Z students explicitly expressed favourable attitudes toward sustainable consumer behaviour. However, the authors recommend that encouraging responsible consumerism and environmentally friendly behaviours is an important goal in sustainability education. Relatedly, Ahamad and Ariffin (2018) affirm high levels of sustainable consumption knowledge within the Gen Z cohort, contrary to moderate levels of sustainable consumption attitudes and practices among university students. The authors, therefore, posit a significant association between sustainability knowledge, attitudes and practice.

Furthermore, in applying the theory of planned behaviour as a theoretical framework for understanding Gen Zs' sustainable consumption behaviour, Vantamay (2018) similarly observes that suitable sustainability education and exposure to environmentally-positive messages can lead to changes in attitudes, subjective norms, and perceived behavioural control, which can in turn co-predict sustainable consumption behaviour. Correspondingly, Yildiz and Kelleci (2022) verify that Gen Zs exhibit a greater

propensity for sustainable consumption behaviours compared to the previous generations. The findings from their study confirm the presence of core environmental and social sustainability indicators acknowledging (1) the seriousness of environmental and social concerns, (2) existing knowledge of environmental and social issues, (3) sustainability advocacy and word-of-mouth communication, and (4) affirmative actions, attitudes and intentions toward sustainable consumption.

As previously discussed, Gen Zs represent not only the newest generation of consumers but also the generational cohort with a strong sustainability orientation. The rise of sustainable consumerism has been accelerated due to this generation's sustainability-oriented consumerism, ecological and social consciousness, self-transcendence and expectations of corporate social responsibility and sustainability actions (Khalil et al., 2021; Sakdiyakorn et al., 2021). Recent extant research indicates the heightened sensitivities of the younger generation (compared to the previous generational cohorts) regarding issues such as overconsumption, depletion of natural resources, climate change, the carbon footprint of products and activities, impacts on the environment and sustainability concerns (Bulut et al., 2017; Giachino et al., 2021; Homer & Khor, 2021). This is the generation that demonstrates an awareness and interest in sustainability values. After all, they are the generation postulated to inherit today's sustainability challenges and bear their consequences for the future. As Dai and Chen (2021) observe, Gen Zs are impassioned in environmental activism. The abovementioned generational traits and proclivities will inadvertently shape the generational cohort's experiences and discourse within the educational and learning spaces. Concurrently, the integration of sustainability agendas and debates into higher education institutions (HEIs) has increased during the past decade (Lozano & Barreiro-Gen, 2021). Increasingly, more institutions are incorporating and institutionalising sustainability education into their curriculum, research, operations, outreach, evaluation, reporting, and interaction with internal and external stakeholders (Caeiro et al., 2013). There has been growing interest in incorporating sustainability into the curriculum at all levels to help students comprehend their sustainability orientations, value propositions, decision-making and actions, including their collective impacts on the environment and society. These implications on sustainability discourse in HEIs are discussed in the following section.

Governmental and institutional policies: Implications on ecopedagogical approaches for sustainability in higher education

The third and final thematic dimension informing the proposed ecopedagogical conceptual framework for sustainability education of Gen Zs in higher education relates to the debates concerning governmental and institutional policies. As noted in the preceding discussions, sustainability and ecopedagogical considerations have received increased attention in recent years (Liu et al., 2022; Misiaszek, 2020; Wamsler, 2019). According to Žalėnienė and Pereira (2021), to support the ambitious UNSDGs' goal achievement and

shape future sustainability leaders, HEIs have a significant responsibility. This is pertinent within the context of this study since Gen Zs' sustainability orientations and perceptions today may precipitate the policies of tomorrow (Homer & Khor, 2021). The credibility and status of a university globally also rely heavily on how it implements ecopedagogy and sustainability education, particularly since HEI graduates and their frames of reference may be regarded as change agents for sustainability (Gedžūne & Gedžūne, 2011). As Shephard (2008) suggests, HEIs are particularly suited to contribute an explicit function in influencing the values and attitudes of future graduates towards environmentalism and responsible, sustainable behaviours. In order to bring about the necessary change in society to meet UNSDGs targets, HEIs need to transition from the partial and fragmented strategic approach to a positive stance, evaluate their existing operational systems, and raise their levels of ambition (Sibbel, 2009; Yáñez et al., 2019). However, because HEIs are intrinsically linked to and impacted by external forces, these institutional reforms will require support from government policy. Only after that will HEIs be in a position to effectively use outreach to disseminate knowledge learned to society through a coordinated and integrated strategy (Shawe et al., 2019).

As the goal of universities shifts gradually away from traditional education and research toward a 'third mission', HEIs' abilities to work collaboratively with communities and foster partnerships with governments are becoming more crucial to achieving societal impacts (Driscoll, 2009; Howitt, 2013; Liu et al., 2022; Mbah et al., 2022; Plummer et al., 2021). As Plummer et al. (2021) note, HEI partnerships with non-academic sectors and community stakeholders are vital in forwarding transdisciplinary sustainability inquiry within the science-action nexus. However, there is a paucity and complexity in the successful cultivation of such stakeholder partnerships. Moreover, the UNSDGs framework emphasises the importance of establishing effective collaborative networks between HEIs and stakeholders in order to develop sound sustainability curricula and actions (Aleixo et al., 2020). In this respect, Leal Filho (2015) states that the absence of formal commitments to sustainability in many HEIs and the lack of formal plans or strategies indicates the absence of a sense of direction. Thus, effective collaboration between diverse stakeholders, sound policies implemented and the commitment of fiscal resources are needed to safeguard and support actionable sustainability initiatives in HEIs (Mbah et al., 2022). However, Farinha et al. (2017) observe that there are often minimal references to sustainability education in national government plans, policies, and programmes and limited sustainability-related ecopedagogical approaches at the higher education level. Therefore, there is value in examining the discourse concerning the role of government stakeholders and the significance of policymaking in HEIs. Yet, Ryan et al. (2010) note a number of gaps between policy and practice, particularly those relating to the objectives concerning environmental sustainability and HEI's integration. Likewise, Shawe et al. (2019) acknowledge the significant challenges of establishing synergistic integration of sustainability into HEI policies. They posit that sustainability agendas may not often be a policy priority in HEIs, despite the presence of numerous projects and very few comprehensive strategic approaches.

Consequently, governments, HEIs and other key stakeholders may be in conflict with each other due to the differences in policy and funding priorities (Aleixo et al., 2020; Shawe et al., 2019). The risk of developing ‘sustainability fatigue’ may eventually show up, leading to a return to silo-based development strategies. Hence, HEIs must accept their shifting responsibilities and position of influence within sustainability education and shape the sustainability orientation of future generational cohorts. Concurrently, governments must recognise how research, data, and knowledge have shaped the UNSDGs and sustainability education and how HEIs may have the potential to integrate and enrich the knowledge ecosystems and specialisations for successful ecopedagogical implementation of sustainability education in higher education (Aleixo et al., 2020; El-Jardali et al., 2018; Leal Filho, 2018; Xypaki, 2015). Therefore, the holistic pursuit of sustainability education in higher education may flourish through the concerted effort of HEIs, governmental policymakers, and educational stakeholders. However, it is important to acknowledge that there are notable barriers that may hamper these efforts.

Polymaking for the implementation of sustainability in HEIs is one of the barriers at the macro-level or national level (Leal Filho et al., 2018; Weiss et al., 2021). Further, this barrier is directly linked to a lack of and/or absence of: (1) HEI sustainability collaboration networks, (2) government initiatives to promote the implementation of sustainability, (3) synergy in the adoption and diffusion of sustainability in HEI curricula, (4) funds for sustainability projects, (5) qualified staff and/or senior staff members to supervise sustainability initiatives, and (6) suitable projects between businesses and universities (Adom̃bent et al., 2019; Caeiro et al., 2013; Plummer et al., 2021; Trencher et al., 2013). Thus, in order to shape and influence policy, particularly in relation to sustainability education, HEIs need to organise, synergise, and coordinate lobbying and advocacy initiatives. Governments and other key stakeholders should ensure that debates about sustainability agendas are collectively centred around the HEIs’ core priorities, values and learning outcomes (El-Jardali et al., 2018). Similarly, Machado and Davim (2022) recommend investigating and developing critical tools and frameworks for diverse HEI and Government contexts and emphasise the crucial significance of broader policy implications since these integrate into the acknowledgement and promotion of sustainability concerns. Notwithstanding these acknowledgements in extant discourse, Cheeseman et al. (2019) observe limited research attention focusing specifically on assessing the implications of government and institutional policy to practice in HEIs. As aforementioned, HEIs’ ability to successfully develop ecopedagogical strategies and sound policies for sustainability education provides the catalyst for a stronger and more effective investment in supporting research, educational development and advancing awareness for sustainability.

Discussion and conclusions

The literature discussed in the preceding sections spotlights the inherent challenges of sustainability agendas on extant dominant pedagogical discourse in higher education (Sandri, 2022). As highlighted by Shephard (2008), there

are significant challenges in integrating the interdisciplinary complexities of education for sustainability in higher education. When compounded with the intricacies of negotiating Gen Z dimensional attributes, the diversity and complexities of the thematic dimensions and educational stakeholders in the sphere of sustainability education multiplies. In that respect, this study focuses on the thematic integration of: (1) ecopedagogy and sustainability education, (2) Gen Z sustainability attributes and perceptions, and (3) governmental and institutional policy mediating effects on HEIs. The proposed ecopedagogical conceptual framework for sustainability education of Gen Zs in higher education (Figure 1) illustrates the nexus between the three interacting dimensions which support ecopedagogical outcomes in higher education for both the learners and the HEIs. These thematic dimensions and their intersections are discussed below.

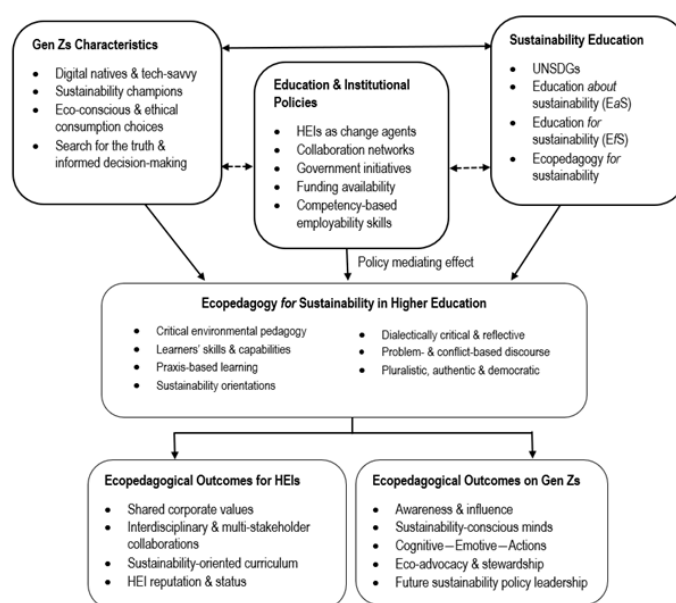


Figure 1: An ecopedagogical conceptual framework for sustainability education of Gen Zs.

The first thematic dimension in the framework shines the spotlight on the generational segment in focus – the Gen Zs. As discussed in the literature and preceding sections, Gen Zs are the generational cohort that will bear the greatest impact of environmental degradation and climate change and demonstrate the most profound concern for it. Being the first generation of true digital natives, they have access to the right information to make informed decisions about their purchases (Dobrowolski et al., 2022; Francis & Hoefel, 2018). They are aware of actions being taken by corporations regarding their sustainability and corporate social responsibility efforts (Dabija et al., 2019; Khalil et al., 2021). Gen Zs have seen that actions (or inactions) from the preceding generations have brought us to our current situation and hence have taken on the mantle of becoming sustainability champions. They have an awareness of how their actions influence the environment and hence are best equipped to make eco-conscious and ethical consumption choices to mitigate their impacts on the environment. Gen Zs are more likely than previous generations to search for the truth behind the products they purchase and

make decisions that are in line with their attitudes toward environmental sustainability (Kaplan, 2020; Mahapatra et al., 2022; Sakdiyakorn et al., 2021).

Notwithstanding these strong suppositions from extant literature concerning the notable characteristics of Gen Zs, as acknowledged in the preceding sections, we concede that these statements of tendency may not apply to all Gen Zs equally or universally. Nonetheless, this combination of digital savviness, access to information, attitude towards sustainability, and bias for action makes them the generation that will impact sustainable consumption and, hopefully, environment preservation and sustainable development. Thus, within the context of this study and the proposed conceptual framework, these unique characteristics of the Gen Zs, as key stakeholders and leaders in the new century, denote the first impacting thematic dimension affecting the investigation of ecopedagogy *for* sustainability in higher education.

The second thematic dimension in the framework relates to sustainability education, and specifically, the implications of its evolution from EaS (education *about* sustainability) to EfS (education *for* sustainability) and ecopedagogy *for* sustainability. This progression in focus from mere knowledge transfer to the transformation of attitudes, values and perceptions, and the subsequent reflective, praxis-based learning of critical pedagogies is necessary if we are to adequately respond to and address the socio-ecological 'wicked problems' of our time (Misiaszek, 2018; Sandri, 2022; Shephard & Furnari, 2013). As Wamsler (2020) highlights, "more holistic pedagogies are urgently needed to address today's challenges, as education is one of the most powerful and proven vehicles for sustainable development" (p. 113), wherein sound sustainability education is seen as both an end and a means, as advocated within the UNSDGs. In this regard, ecopedagogical approaches to sustainability education facilitate opportunities for more authentic, pluralistic and democratic discourse within the higher education learning space. The hope is for a more humanistic, socially-just and future-oriented ecological agenda applicable to the sustainability orientations of Gen Zs (Horner & Khor, 2021; Kahn, 2008). However, Singh and Segatto (2020) highlight significant challenges faced by HEIs to effectively implement successful sustainability education strategies due to constraints such as (1) institutional policymaking, (2) curricular structures, (3) cultural barriers, (4) teaching approaches, (5) methodological barriers, (6) competencies of change agents, (7) availability of resources, and (8) measurements of sustainability learning outcomes. Consequently, the proposed conceptual framework brings to light the implicit policy mediating effects within its schematic illustration.

As illustrated in Figure 1, educational and institutional policies in HEIs will impose mediating effects on ecopedagogical outcomes in sustainability education. This thematic dimension within the proposed conceptual framework emphasises that government policies may be perceived as a catalyst in the transition towards ecopedagogy *for* sustainability educational outcomes. Concurrently, it also highlights that HEIs can only adopt the relevant policies and facilitate the changes if there is integration, synthesis and

collaboration amongst the key stakeholders within the HEI space (Aleixo et al., 2020; Misiaszek, 2020; Plummer et al., 2021; Wamsler, 2019). As noted in the literature and preceding discussion, there are significant challenges in prioritising and instituting the synergistic integration of sustainability action plans into HEI policies and strategies (Shawe et al., 2019). Further, in this contemporary era of governance and policymaking, it is critical to assess how government policies are implemented. Government initiatives should engage the HEIs in collaborative strategic visioning and discussions, laying the foundation for long-term goals and objectives. Given the urgent societal challenges associated with environmental degradation, the university's role as a change agent and an 'implementor' of ecopedagogy *for* sustainability education is growing. However, the implementation can only be accelerated through the availability of funding and support from industry or other stakeholders, the engagement of specialised knowledge domains, and academicians and/or administrative staff who participate and lead in such communities of practice and interest. As Sibbel (2009) posits, extant partial and fragmentary strategies must be substituted by a proactive approach, wherein a reassessment of current operating models and more ambitious environmental targets are initiated to reach national and global sustainability agendas. The proposition of a more focused ecopedagogical approach to sustainability education in HEIs may perhaps serve to better cultivate and augment Gen Zs' sustainability inclinations towards greater critical knowledge development, proactivity and commitment towards sustainability action.

Fundamentally, the objective of sustainability education is to "influence economic and political structures through educating citizens and future professionals" (Sandri, 2022, p.115) towards achieving greater social equality, as well as mitigating human impacts on the natural environment and its life support systems. The synergism of the above three thematic dimensions highlights the value of critically examining the inherent characteristics of Gen Zs, the attributes of their sustainability orientations, and the implications of HEI policy mediating effects on ecopedagogy-based sustainability education. Correspondingly, there will also be anticipated implications on priorities of sustainability in higher education curricula, practice and research. Therefore, the final dimensions within the proposed framework focus on the ecopedagogical outcomes for sustainability education relating to (1) outcomes for HEIs, and (2) outcomes for Gen Z learners. This concluding step within the framework underscores the core principles and intentions of ecopedagogy *for* sustainability education – the need to critically evaluate sustainability learning outcomes. However, such an assessment of learning outcomes should not only focus on the external and institutional dimensions of ecopedagogy-based sustainability education but also the internal dimensions of the individual learners. Since learners' sustainability orientations and perceptions are rooted in their educational, disciplinary and learning experiences, examining the critical internal dimensions of the individual is also important (Cotton, 2009; Fisher & McAdams, 2015; Wamsler, 2019). This is therefore reflected in the proposed conceptual framework.

This conceptual paper explored the key dimensions required to investigate the sustainability orientations and education outcomes of the evolving Gen Z cohort. As noted in the preceding sections, extant research on Gen Zs is still nascent, particularly from the perspective of Gen Z learners through the lens of ecopedagogy-based sustainability higher education. Based on the literature review, an ecopedagogical conceptual framework for sustainability education of Gen Zs is developed and proposed for further empirical research. Whilst there is no empirical data collected at this stage of the study, the results of the literature review and preliminary analysis of sustainability priorities from our institutional cohorts across transnational locations offer support for further exploration and the opportunity to expand and assess the applicability of this framework empirically in stage two of the study. We acknowledge that the scope of literature and preliminary research discussed in this paper is not a conclusive generalisation of all works related to Gen Zs and pedagogical approaches to sustainability in higher education. Nonetheless, we believe that it presents useful insights into the current issues, challenges, and discourse concerning Gen Zs and sustainability education agendas for the future. Particularly within the context of higher education discourse, it is evident that future research investigating the key facets of Gen Z perspectives and global sustainability agendas is worthwhile. In the next stage of research, the study will apply the conceptual framework proposed and develop the research instrument to empirical data collected from relevant Gen Z university student cohorts. These data can subsequently provide valuable in-depth insights into the sustainability orientation and generational implications of employing ecopedagogical approaches in higher education. Additionally, there are also opportunities to further develop and adapt this conceptual framework to other forms of teaching and learning practice. Thus, whilst this work is presently conceptual within its current frame of reference, there is value in its exploration. As aptly noted in the UNSDGs 2030 agenda, the time to take action for the sustainable future of our planet, people and prosperity is now, and the generation shaping that future is the Gen Zs.

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