Investigating the relationships between student well-being and perceived environmental sustainability: Student environmental attitudes as a moderator

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Abstract

Purpose - Higher education institutes (HEIs) face two key challenges: low levels of environmental sustainability and students with low levels of well-being. This paper suggests that, because of the interconnectedness of sustainable development goals, there may be a single solution to meet both these challenges, namely, increased sustainability. The purpose of this paper is to test whether higher perceived sustainability is associated with higher well-being, moderated by student attitudes towards the environment.

Design/methodology/approach - This study followed a quantitative design. Students enrolled at a New Zealand university completed an online questionnaire (n = 292) measuring student perceptions of their HEI's environmental sustainability, their attitudes towards the environment and their well-being. Regression and moderation analyses were conducted to test hypothesised relationships.

Findings - Students' sustainability perceptions positively predicted student well-being. However, student attitudes towards the environment did not moderate this relationship.

Originality/value - This study contributes to an emerging field by investigating the relationship between sustainability and well-being. The findings suggest HEIs may be able to improve their performance in multiple ranking criteria (student well-being and environmental sustainability) by focusing on sustainable practices and supporting students in their personal sustainability efforts.

Keywords - Sustainability, Well-being, Environmental attitudes, Impact rankings, SDGs

1. Introduction

Higher education institutes (HEIs), like all modern organisations, are under increasing pressure to improve their environmental sustainability. Being perceived as "green" enhances an HEI's appearance and reputation to both their internal stakeholders, particularly staff and students, as well as external stakeholders, including potential future students, government and funding bodies and the wider public (Dabija et al., 2017). At the same time, HEIs are dedicating more resources to student well-being, especially given the growing concerns over declining well-being levels in the student population worldwide (Duffy et al., 2020; Lipson et al., 2022). The United Nations' Sustainable Development Goals (SDGs) recognise the interconnectedness of environmental sustainability and human well-being, urging countries and organisations to work towards a future that protects the planet and improves peoples' lives (United Nations, 2022). There is emerging evidence supporting a relationship between sustainability and well-being (Jabbar et al., 2022; Reyes-Riveros et al., 2021), but this connection remains underexplored within the higher education context.

Recent research has begun to examine the relationship between sustainability and well-being, but key gaps remain in understanding how sustainability efforts within HEIs impact students. While some studies indicate that environmentally sustainable practices can have positive psychological and physical benefits, much of this work has been conducted outside of the higher education sector. Additionally, while students are often highly concerned about environmental issues (Bøhlerengen and Wiium, 2022; Piscitelli and D'Uggento, 2022), little is known about whether their environmental attitudes moderate the relationship between perceived sustainability and well-being. Addressing these gaps is critical for HEIs aiming to enhance both sustainability and student well-being in a meaningful way.

This paper examines the extent to which HEI sustainability can influence student well-being. To do so, data were gathered from a sample of students enrolled in an HEI ranked in the top 100 sustainable universities worldwide and tested the proposed relationships using moderated regression analyses. The findings support the relationship between sustainability and well-being, though the moderating effects of student environmental attitudes are less clear. This study contributes to the literature by exploring these links within a higher education setting. The remainder of this paper is structured as follows: A review of literature introducing the UN's Sustainable Development Goals and their influence on HEIs, student well-being, sustainability and its key components and student's environmental values; Research methodology including participants and procedure, measures used and details on data analysis; Results which reports

the findings of correlational, regression and moderation statistical tests; Discussion including a general overview of the findings, theoretical and practical implications, limitations and authors suggestions for future research in the area; and finally, a conclusion, briefly summarising the research.

2. Literature review: Sustainability in higher education institutes

As part of HEIs' efforts to develop a reputation for environmental sustainability, they are increasingly measuring progress against the United Nations (UN) SDGs. The SDGs (see Table S1 in supplementary information for a full list) were introduced by the UN in 2015 with the ultimate aim of ending poverty, protecting the planet and improving the lives of all humans (United Nations, 2022).

A key strength of the SDGs is their interconnectedness. Dörgő et al. (2018) analysed the cause-and-effect relationships between the 17 SDGs and 169 underlying targets. They identified over 4,000 causal relationships, demonstrating the impressive extent to which the SDGs are interconnected. For example, if an HEI invested in recycling initiatives, then this directly contributes towards SDG 12 (responsible consumption and production), as well as reducing the amount of waste it creates and thus indirectly contributing towards SDGs 13 (climate action),14 (conserve the oceans) and 15 (protect terrestrial ecosystems). The argument can also be made that, by increasing demand for recycling facilities and workers, the HEI indirectly contributes towards SDGs 8 (sustainable economic growth), 9 (sustainable innovation) and 11 (sustainable communities).

In HEI settings, the SDGs are used not only as targets to guide sustainable development but also to assess the sustainability of institutions. The Times Higher Education (THE), for example, has ranked HEIs based on teaching, research and international outlook since 2004. In 2019, to reflect the global increase in awareness of the importance of sustainability, THE began to also rank universities against each of the 17 SDGs via the Times Higher Education Impact Rankings. Despite these impact rankings being around for less than five years, a controversy has already emerged (Bautista-Puig et al., 2022), with a main criticism being the lack of clarity on how much each SDG influences the overall rankings. As an example of this, De la Poza et al. (2021) found the highest-ranked HEIs focused more on SDGs 9 (sustainable innovation) and 16 (peace, justice and strong institutions). While all SDGs are unequivocally important for sustainable development, the layperson may see these rankings as a measure of environmental

sustainability or how “green” an institution is, especially considering the importance of rankings to prospective students, and the influence that perceived environmental sustainability has over the choices of the modern consumer (Koenings et al., 2020). Despite the criticisms, the argument is often made that any incentive to increase the sustainability of HEIs is positive. Furthermore, rankings of sustainability aim to promote accountability and transparency within the HEI sector (Burmann et al., 2021). Overall, this stresses the importance of rankings to both institutions and students and the authors now consider the role of specific SDGs in the higher education context.

2.1 Student well-being

SDG 3 is to “Ensure healthy lives and promote well-being for all at all ages” (United Nations, 2022). Well-being is commonly divided into two constructs: eudaimonic and hedonic, often referred to as flourishing and happiness (Waterman, 1993). Eudaimonic well-being reflects psychological happiness and arises from experiences that give us meaning and purpose. On the other hand, hedonic well-being is conceptualised as subjective happiness or simply, living a life full of pleasure (Waterman, 1993). These two distinct constructs have evolved into the research models of subjective well-being (Diener and Ryan, 2009) and psychological well-being (Ryff and Singer, 2008). Subjective well-being follows a hedonistic perspective, focusing on an individual’s assessment of life quality, while psychological well-being takes a eudaemonic approach, emphasising personal growth and the fulfilment of one’s potential. While there are differences between the two research models, they are often used in tandem to provide a comprehensive measure of an individual’s well-being (Yeo and Suárez, 2022).

While SDG 3 focused on well-being is aimed “for all at all ages”, recent well-being reports show students as disproportionately experiencing low well-being and mental health issues compared to the population overall. Globally, around 35% of tertiary students have reported at least one mental disorder and self-reported levels of well-being are consistently lower in students than in the general population (Auerbach et al., 2018). It is important to note there is no evidence that HEIs directly decrease well-being and increase mental illness symptoms for students. However, it is often suggested that daily stressors associated with attending a HEI play a key role (Duffy et al., 2020). Of further concern to HEIs is that low levels of student well-being, and associated concepts such as anxiety, are correlated with low academic performance

(Steinmayr et al., 2016), another important ranking factor that affects the image of the HEI with a range of external stakeholders, including future students and employers.

As such, in recent years, the concern for student mental health and general well-being has become an emerging priority within the global higher education sector (Dodd et al., 2021). HEIs have been encouraged by governments, stakeholders and the students themselves to prioritise the well-being of all students, leading to the creation of university mental health guidelines in the UK. Indeed, these have been adopted internationally and are aimed at recognising and rewarding good practices within the sector (Hughes and Spanner, 2019).

2.2 Environmental sustainability

Other key SDGs relevant to HEIs pertain to environmental sustainability, in particular SDGs 11–15 (see supplementary information Table S1). Environmental sustainability is about managing and sustaining life support systems through protecting and maintaining the planet's natural capital (Goodland, 1995). The broad aim of these SDGs is to guarantee resources are not overused and, instead, will be forever available to sustain future generations (United Nations, 2022). Essentially, sustainability is ensuring there is enough for all, forever. To be environmentally sustainable as individuals, organisations and institutions, humankind must all live within the regenerative capacity of our planet, something which has not been achieved since the 1980s (Rees, 2023).

As these descriptions show, environmental sustainability is a broad construct. Coupled with its dynamic nature and the resulting lack of measurement framework standardisation, it is often identified as difficult to measure (Hall et al., 2022). A further notable critique of sustainability measurement includes the one-size-fits-all approach taken by external ranking systems which often fails to align with the diverse priorities and specific resource constraints of HEIs (Alghamdi et al., 2017). Therefore, the present study focuses on two domains of sustainability: organisations protecting the natural environment and organisations supporting employees to protect the environment. These two domains are then combined into a comprehensive summary measure of sustainability.

2.2.1 Protection of the natural environment.

An increasing number of public-facing organisations around the world, including HEIs, are striving to reduce their environmental impacts and protect the natural environment to play their part in mitigating the current environmental situation (Collado et al., 2022). These actions are fuelled by external pressure from governments and the general population, as well as internal pressures from staff and students (Brinkhurst et al., 2011; de Lange, 2013). In a higher education context, HEIs aspire to be environmentally sustainable to not only benefit the natural environment but also be seen as green which gives them a competitive marketing advantage to attract staff and students as well as please stakeholders (de Lange, 2013).

Outside of higher education contexts, research has addressed the effect of environmental sustainability on well-being at the individual level. For example, spending time in nature is correlated with increased life satisfaction, physical and psychological well-being as well as decreased mental distress (Delbert et al., 2024; Jabbar et al., 2022; Reyes-Riveros et al., 2021). Furthermore, protection of the natural environment has positive impacts on well-being through helping to meet our basic human needs and providing the feeling of doing good for the planet (van den Born et al., 2018). Additionally, as individuals become more concerned with the environment, the desire to be a part of sustainable organisations increases. Notably, this has been observed in prospective students choosing which HEI to attend by its sustainability-related attributes, with a 2021 survey showing an institution's sustainability was more important to a prospective student than the HEI's location (Shepard et al., 2021).

While the protection of the natural environment benefits institutions, individuals and, to an extent, the wider community, a further key aspect of HEI sustainability is the degree to which HEIs actively support and encourage sustainable behaviours among their staff and students – referred to as perceived organisational support towards the environment (POS-E).

2.2.2 Perceived organisational support towards the environment.

It is undoubtedly important for HEIs to follow sustainable policies, processes and practices. Beyond this, it is also important for HEIs to focus on the human aspects of sustainability within their organisations (Zhang et al., 2024). Organisations can support individuals by encouraging and supporting staff and students to carry out pro-environmental behaviours (PEBs) both within and outside the institution (Khan and Terason, 2022). PEBs, also referred to as eco-friendly behaviours, green behaviours or sustainable behaviours, are actions taken by individuals that

aim to protect the environment. Commonly seen examples of PEBs include making sustainable purchasing choices, recycling, conserving water and/or energy or switching to more sustainable modes of transport (Krajhanzl, 2010). Organisations can support PEBs through actions such as providing facilities for and encouraging recycling and waste reduction, thus enabling and encouraging individuals' green behaviours.

The extent to which an individual feels that their organisation is supporting these PEBs is referred to as POS-E. POS-E consists of an individual's feelings and beliefs about how much the organisation or, in a higher education setting their institution, values an individual's contributions towards environmental sustainability (Lamm et al., 2015). Both organisations and individuals benefit from high POS-E. Specifically, when individuals feel supported by their institution, their needs for approval are met and their esteem and affiliation are increased, leading to higher levels of commitment towards the organisation and higher levels of psychological empowerment (Koomson, 2022). POS-E is also positively related to job satisfaction, a common measure of workplace well-being and negatively correlated to intentions to leave the organisation (Lamm et al., 2015). Looking solely at students, studies have found correlations between HEI support and positive outcomes such as loyalty to their institution (Koomson, 2022), career adaptability and career exploration (Ma et al., 2023). Given the positive links of POS-E to well-being among employees and with positive outcomes such as loyalty among students, the authors anticipate that students will also experience well-being benefits from POS-E.

In the current study, these two domains, protection of the natural environment and POS-E, are combined to form the construct of perceived environmental sustainability. Given the literature reviewed above, which suggests that HEIs protecting the natural environment and supporting their students to take sustainable actions will have a positive impact on student well-being, the authors hypothesise:

H1. Student perceived environmental sustainability of the higher education institutes will positively correlate with student well-being.

2.3 Student environmental attitudes

Younger people and student populations have consistently tended to report higher levels of concern for the climate and environmental issues (Bøhlerengen and Wiium, 2022). They are, therefore, more likely to hold stronger environmental attitudes and engage in PEBs (Milfont et al., 2021; Piscitelli and D'Uggento, 2022). Environmental attitudes are an individual's evaluation of the natural environment and the factors that affect it (Milfont, 2012). The construct of environmental attitudes is unidimensional and measured on a linear spectrum ranging from unconcerned about the environment to very concerned about the environment (Dunlap et al., 2000). Overall, younger people and students score higher on this spectrum and, thus, provide important drivers for change (Ernst et al., 2017). Of particular and unique concern for younger people is the perception that many environmental risks and hazards affect them disproportionately through a lack of control over environmental issues and the notion they will have to live with the consequences of current organisational and governmental decisions, while those people making the decisions will have died without experiencing the harmful impacts (Sanson et al., 2019).

Key factors that help shape younger peoples' environmental attitudes include the people they surround themselves with (friends, family members and teachers) as well as the educational institutions they attend (Chawla and Derr, 2012). Therefore, if an HEI places focus on creating a sustainable and PEB-supportive environment, then their students may be more likely to hold strong environmental attitudes which are, in turn, associated with engaging in PEBs (Ernst et al., 2017). In line with this, research has found positive correlations between organisational sustainability policies and individuals' environmental attitudes (Dahiya, 2020). Beyond this, the authors draw on the theory of person-organisation fit (Judge and Kristof-Brown, 2004), whereby a better alignment between the individual's values and the organisation's values results in higher well-being and engagement (Chen et al., 2016; Sousa and Porto, 2015). When people experience organisational climates that fit their preferences, this can augment their preferred ways of acting. Diverse types of person and organisation fit have been examined, ranging from personal style to work values and ethics (Cooper-Thomas and Wright, 2013), and here, the authors extend the application of the theory to propose that when students' and HEIs' environmental values align, there will be beneficial effects. Therefore, this paper suggests that student environmental attitudes will interact with perceived sustainability to influence well-being, such that students who hold strong environmental attitudes will benefit more from their

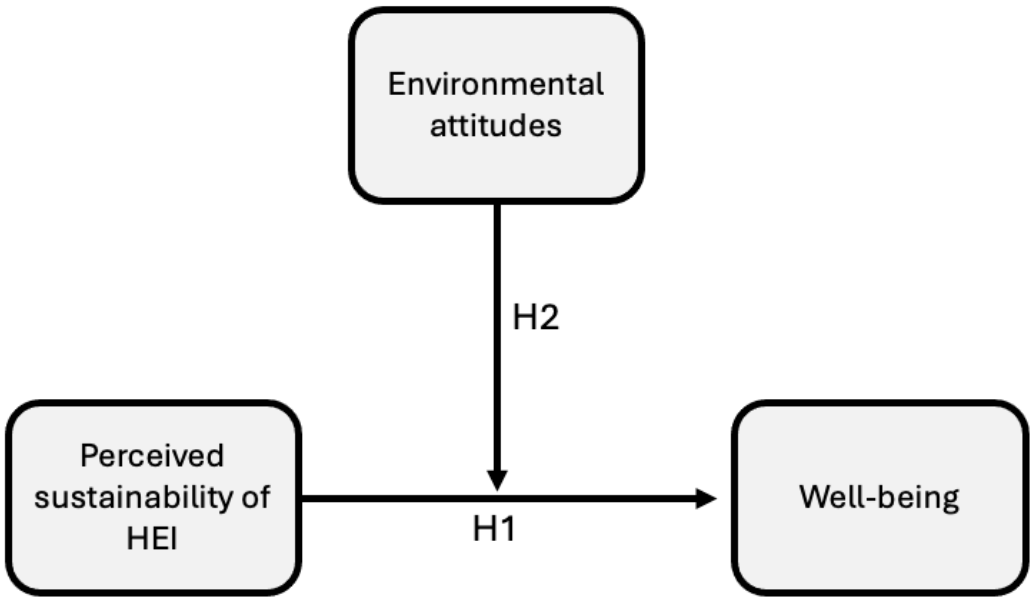
HEI's sustainability efforts and therefore report higher levels of well-being. The authors hypothesise:

H2. Students' environmental attitudes will moderate and strengthen the positive relationship between students' perceptions of higher education institutes' sustainability and students' well-being.

2.4 The present study

Despite the growing importance of both environmental sustainability and student well-being in the higher education context, the links between student perceptions of their HEI's environmental sustainability and student well-being remain unclear. To address this gap, this paper seeks to test the relationship between student perceptions of their HEI's environmental sustainability and student well-being, while also exploring the moderating role of student attitudes towards the environment on this relationship, illustrated in Figure 1.

Figure 1. Hypothesised model



Note(s): H1 represents a correlational relationship, but a directional arrow is used for visual clarity in illustrating H2

Source(s): Authors' own work

3. Method

3.1 Participants and procedure

Data were collected from students (n = 292) currently enrolled at an HEI in New Zealand ranked in the top 100 universities by THE-IR for 2023 for progress towards the UN's SDGs. Thus, it might be expected that at least some students selected this university as one where their own sustainability preferences would be met by the HEI. Students were invited to participate in one of three ways: firstly, all university-affiliated clubs and societies were contacted and asked to invite their members through social media and mailing lists; secondly, posters were placed around campus. Participants recruited using these methods (n = 135) were not offered compensation. Finally, students enrolled in undergraduate psychology papers were invited to participate for a small amount of course credit (n = 157). These participant selection methods were chosen to increase sample size. No significant differences were found on any study variables between participant recruitment methods. The sample comprised 82 students who identified as male, 198 who identified as female and 12 students who identified as other or chose not to disclose. Age ranged from 17 to 65 years with M = 24.21 and SD = 8.12. The majority of the sample (64.7%) identified as New Zealand European, 21.2% identified as Māori, 17.8% identified as Asian and 21.6% as other. The university where students were surveyed is split over multiple campuses; therefore, participants were also asked which campus they studied at; no significant differences were found between campuses.

The study was cross-sectional and involved participants taking an online survey. Participants were provided with an online brief that contained information about the study, their role as a participant, their rights, the confidentiality of collected data, funding and ethical approval (FS2023-32). All participants gave informed consent before beginning the online survey, which took approximately 10 min to complete.

3.2 Measures

Student well-being was measured using the Employee Well-Being Scale (Zheng et al., 2015), modified to refer to a university context. A full list of modified items can be found in the supplementary information, (Table S2). The scale consists of three subscales (six items each) covering facets of well-being in a university student setting. Life well-being includes items relevant to students' lives both inside and outside of the university, for example, "My Life is very fun". Study well-being (work well-being in Zheng et al.'s original scale) includes items relevant

to student's thoughts and feelings in university settings, for example, "In general, I feel very satisfied with my present studies". Psychological well-being includes items that focus on student's psychological needs, for example, "I feel I have grown as a person". Participants respond to the scale's items using a six-point Likert scale ranging from 1 "never" to 6 "all of the time". In the present study, the scale reliability was found to be good ($\alpha = 0.90$) (see Table 1 for subscale reliability).

Table 1

Descriptive statistics and correlations between well-being and its subscales, sustainability, protection, support and environmental attitudes (n = 292)

	1	2	3	4	**5**	6	7	**8**	*M*	*SD*	*Skewness*	*Kurtosis*
1. Overall well-being	(.90)								4.35	.68	-.398	.218
2. Life well-being	.868**	(.86)							4.15	.88	-.367	.127
3. Study well-being	.829**	.540**	(.87)						4.28	.87	-.713	1.055
4. Psychological well-being	.816**	.621**	.509**	(.72)					4.62	.68	-.265	-.119
5. Sustainability	.156**	.115*	.204**	.056	(.87)				3.94	.67	-.128	.371
6. Protection	.146*	.090	.205*	.058	.853**	(.89)			4.11	.76	-.287	.586
7. Support	.133*	.126*	.154**	.038	.935**	.613**	(.64)		4.24	.86	-.076	.732
8. Environmental attitudes	.073	-.024	.146	.064	-.055	-.076	-.012	(.75)	3.72	.47	-.302	.045

Note(s): Cronbach's alpha values shown in parentheses, scales shown in bold, subscales shown in italics, protection = student perception of HEI's protection of the natural environment, support = student perceived organisational support towards the environment, all skewness standard error = 0.143, all kurtosis standard error = 0.284, **$p < 0.01$ and *$p < 0.05$

Source(s): Authors' own work

As mentioned, measuring environmental sustainability is challenging because of its dynamic nature along with the diverse needs of specific research projects that lead to a lack of standardisation (Hall et al., 2022). This paper measured two domains, perceived protection of the natural environment (hereafter referred to as protection) and perceived organisational support towards the environment (hereafter referred to as support), and combined them to create one measure of the latent construct of perceived environmental sustainability.

Protection was assessed using the Natural Environment subscale taken from the Corporate Stakeholder Responsibility Scale (CStR–NE; El Akremi et al., 2018). This subscale, the CStR-NE, is a unidimensional seven-item measure, adapted for student populations, that asks participants how environmentally sustainable they perceive their HEI to be, for example, "Our university contributes toward saving resources and energy". Participant's answers were recorded on a six-point Likert scale ranging from 1 "strongly disagree" to 6 "strongly agree".

Support was measured using Lamm et al.'s (2015) scale (The POS-E) which extends Eisenberger et al.'s (1986) widely used perceived organisational support scale and measures perceived levels of specific organisational support towards individuals' PEBs. The scale is a five-item, unidimensional scale designed to measure perceptions of the level of support their organisation gives them to be environmentally sustainable. For the present study, it was modified to ask students about the support towards their PEBs they receive from their HEI. Participants' responses were recorded using a seven-point Likert scale ranging from 1 "strongly disagree" to 7 "strongly agree". An example item from the scale is, "My actions toward sustainability are appreciated by my university".

Perceived environmental sustainability was calculated using the mean of all items on both the CStR-NE and POS-E scales. These two scales use a six- and seven-point scale. Therefore, before the mean was calculated, support was reduced from a seven-point response to a six-point response via linear interpolation using the following formula:

$$X_6 = (X_7 - 1)\,(5/6) + 1$$

This was completed after data collection rather than changing the support measure to a six-point scale in the questionnaire to ensure the outcome variability remained as per the scale's design. This combined measure of total perceived environmental sustainability was found to have high scale reliability ($\alpha = 0.87$).

Student environmental attitudes were measured using the Revised New Ecological Paradigm (NEP) Scale (Dunlap et al., 2000). Consisting of 15 items (e.g. "If things continue on their

present course, we will soon experience a major ecological catastrophe"), the NEP can be interpreted as unidimensional (Dunlap et al., 2000). In the present study, the 15-item scale showed acceptable scale reliability ($\alpha = 0.75$). While the NEP can be answered using a number of response formats, in the present study, guidance from Hawcroft and Milfont (2010) was followed, and a five-point scale, ranging from strongly disagree to strongly agree, was used to ensure consistency with both the original scale and the majority of researchers using the NEP.

3.3 Data analysis

Data were cleaned using a four-step process. First, data were excluded if participants answered no to the commitment check question "We care about the quality of our survey data. For us to get accurate measures, it is important that you answer the following questions carefully and honestly. Do you commit to answering all questions carefully and honestly?". One respondent answered no and was excluded. Second, participants ($n = 45$) who completed less than 95% of the survey were excluded, as suggested by Schafer (1999). Third, participants who responded too quickly were excluded ($n = 11$); the cut-off value used was 50% faster than the median completion time, as suggested by Greszki et al. (2014). Finally, a Mahalanobis distance analysis was run to identify and exclude multivariate outliers ($n = 2$). After these four steps, data from 292 participants remained and was included in analyses.

Data analyses began with conducting descriptive and correlation analyses to discover the relationships between all variables. To test hypotheses, regression analyses were conducted to determine variance predicted in well-being by perceived sustainability, followed by testing for the moderating effect of environmental attitudes.

4. Results

Relationships between well-being (overall and three subscales), environmental sustainability (overall and the two subscales of protection and support) and environmental attitudes are shown in Table 1. Overall well-being was found to have significant positive, albeit weak, correlations with protection, support and overall perceived sustainability ($r = 0.146$, $p < 0.05$; $r = 0.133$, $p < 0.05$; $r = 0.156$, $p < 0.01$). The study well-being subscale was also found to have stronger positive correlations with protection, support and overall sustainability ($r = 0.205$, $p < 0.05$; $r = 0.154$, $p < 0.01$; $r = 0.204$, $p < 0.01$). As expected, all subscales of well-being shared

strong positive correlations, and protection was strongly and positively correlated with support ($r = 0.613$, $p < 0.01$).

Two regression analyses were conducted to investigate the influence of student perceived sustainability on overall well-being and specifically on study well-being (Table 2). The study well-being subscale was used as an outcome on its own, as it showed a stronger correlation with sustainability when compared to overall well-being. Sustainability accounted for a small but significant percentage (2.4%) of variance in overall well-being ($F(1,290) = 7.205$ and $p = 0.008$), though this percentage was higher (4.2%) when focusing on the study well-being subscale ($F(1,290) = 12.614$ and $p < 0.001$). Additionally, sustainability was found to significantly predict overall well-being ($\beta = 0.159$ and $p < 0.01$) and study well-being ($\beta = 0.268$ and $p < 0.001$). These results support H1.

Table 2

The results of two regression analyses to determine variance in different types of well-being (overall and study specific) predicted by sustainability

Outcome	*b*	*beta*	sr^2	*r*	*Fit* (r^2)
Well-Being	.159**	.156	.024	.156**	.024
Study Well-Being	.268**	.204	.042	.204**	.042

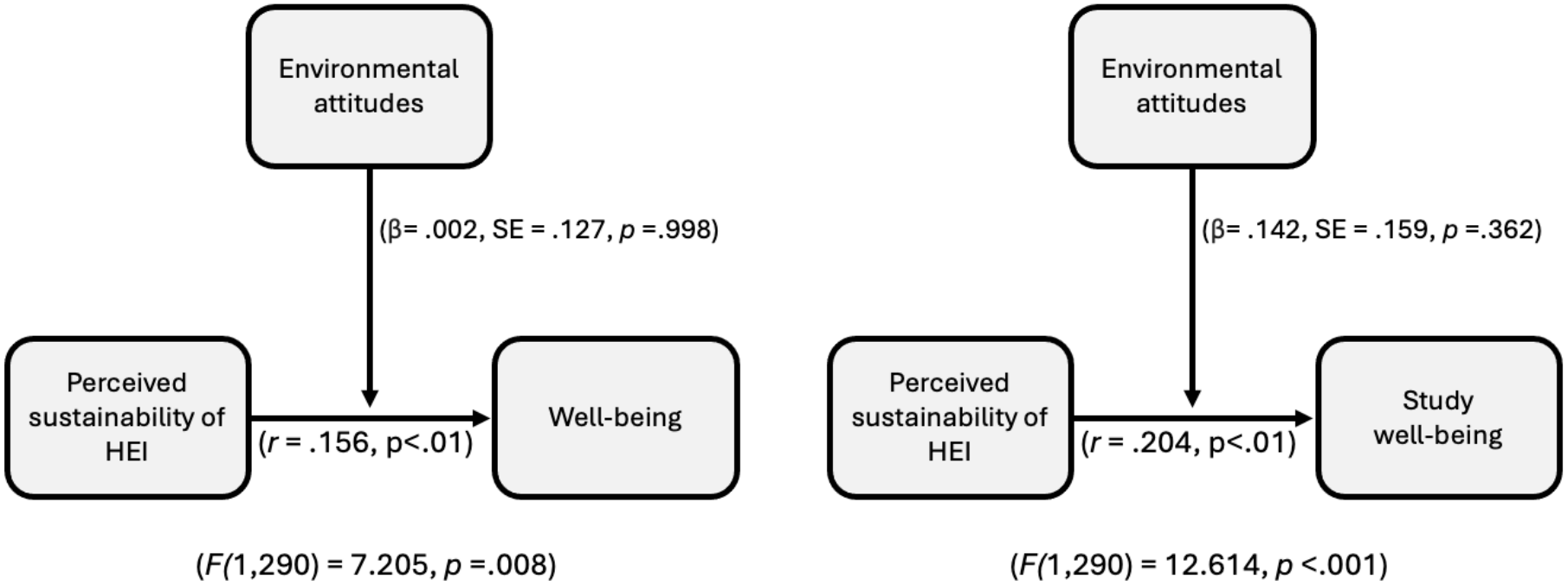
Note(s): A significant b-value indicates the beta weight and semi-partial correlation (sr2) are also significant; *p < 0.05 and **p < 0.01

Source(s): Authors' own work

Moderation analyses were conducted, using Process Macro for SPSS (Hayes, 2013), to test for the moderating effect of environmental attitudes on the relationship between sustainability and both well-being and study well-being. As shown in Table 3, student environmental attitudes were not found to be a significant moderator of either of the investigated relationships. Figure 2 depicts the moderation model. These results do not support H2.

Figure 2

Empirical model of moderation analysis findings, showing the lack of a significant moderating effect of student environmental attitudes on the relationship between student perceptions of higher education institute sustainability and overall (and study) well-being



Source(s): Authors' own work

Table 3

Results of two moderation analyses testing for the moderating effect of environmental attitudes on the relationship between sustainability and two types of well-being; overall and study specific

Outcome	Model	Estimate (β)	*Std. Error*	*t*	*p*	*95% CI*	
						LL	*UL*
Well-Being	Sustainability	.157	.482	.325	.746	-.792	1.106
	Environmental Attitudes	.110	.492	.224	.823	-.859	1.079
	Sustainability * Environmental Attitudes	.002	.127	.015	.988	-.247	.251
Study Well-Being	Sustainability	-.271	.607	-.447	.655	-1.465	.923
	Environmental Attitudes	-.268	.619	-.433	.666	-1.487	.951
	Sustainability * Environmental Attitudes	.146	.159	.914	.362	-.168	.459

Source(s): Authors' own work

5. Discussion

5.1 General discussion

Congruent with existing literature (Jabbar et al., 2022; Reyes-Riveros et al., 2021) and the notion all SDGs are interconnected (Dörgő et al., 2018), this paper expected to find a link between environmental sustainability and well-being in a higher education context. Furthermore, based on prior studies (Ernst et al., 2017; Milfont et al., 2021; Piscitelli and D'Uggento, 2022) and the theory of person-organisation fit (Judge and Kristof-Brown, 2004), this paper expected student environmental attitudes to moderate the relationship between sustainability and well-being.

The findings provide support for H1. This paper found a significant positive relationship between environmental sustainability and well-being. Furthermore, significant positive relationships were found between well-being and the two measures that were combined to measure sustainability: protection and support. Additionally, this paper established that a significant,

though small, proportion of variance in well-being and study well-being was predicted by the HEI's environmental sustainability, providing further support of the link between sustainability and well-being. The findings support the theorised relationship: student perceptions of their HEI's level of sustainability predict well-being in general.

The concept of well-being is much more than just the absence of illness; it is a broad and complex construct that can be influenced by all aspects of an individual's life (Diener and Ryan, 2009). Simply, there are many factors that account for well-being, and unfortunately, student well-being appears to be on the decline. For example, a recent large-scale survey indicated that student mental health problems have increased by 50% in ten years and that over 60% of students have one or more mental health problems (Lipson et al., 2022). Within a New Zealand context, literature on student well-being is limited; however, recent studies have found low levels of student well-being across all students, including at secondary, tertiary, postgraduate and doctoral levels (Murray et al., 2024; Winter et al., 2021). A study of New Zealand tertiary students found over 55% of students had considered dropping out of their studies with the main reasons provided being poor well-being, mental illness and feeling constantly overwhelmed (Khadij, 2018). At a time when HEIs around the world are concerned for student well-being, it is important that the nuances of contributing factors are clearly understood. The finding that HEI sustainability can make a small but significant difference in student well-being (2.4% and 4.2% of variance accounted for in well-being and study well-being, respectively) adds perspective to the current understanding of student well-being and provides HEIs with a promising avenue for future research and intervention.

This paper also investigated the moderating effect of student attitudes towards the environment on these relationships; however, no significant moderating effect was found. The authors consider whether this lack of an expected relationship could be because of a difference between the environmental attitudes of this sample compared to those in previous research. Several studies have surveyed New Zealand student populations' environmental attitudes using the revised NEP scale, notably Liu and Sibley (2004), Schultz et al. (2005) and Milfont, Duckitt and Cameron (2006) (as cited in Hawcroft and Milfont, 2010). These studies (n = 2,148, 217 and 455) found mean scores of student environmental attitudes to range from 3.51 to 3.88 (SD = 0.44–0.74; Cronbach's alpha = 0.72–0.77). The present study's environmental attitudes results (n = 292, M = 3.72, SD = 0.47 and $\alpha = 0.75$) are within this range, so it is unlikely that this sample's attitudes were unique. The authors are confident, therefore, that attitude towards the environment is not a significant moderator in the current sample. However, it

remains likely that the relationship between an organisation's perceived environmental sustainability and individual well-being is influenced by factors beyond environmental attitudes. For example, political alignment and cultural norms have been found to influence perceived sustainability (Hoffarth and Hodson, 2016) and a multitude of factors are known to influence well-being, including personality, relationships and income (Diener and Ryan, 2009). Future research testing the potential moderation of these factors on the sustainability–well-being relationship would be valuable.

5.2 Implications

This study makes both theoretical and practical contributions. The link between environmental sustainability and well-being is understudied, especially so in the higher education sector. This paper has established a positive link between how sustainable students perceive their HEI to be and student well-being, both overall and study specific well-being, providing empirical support for a link between sustainability and well-being in higher education. Furthermore, given the increasing importance placed on university sustainability rankings by external stakeholders such as potential students and parents as well as by the HEI itself, this research highlights the importance of interconnectedness between the 17 SDGs, focusing particularly on the interconnectedness of SDG 3 (representing human well-being) and SDGs 11–15 (representing environmental concern). The results, showing significant correlations between environmental sustainability and student well-being, add to the growing evidence of the strong connections between the 17 goals (Dörgő et al., 2018).

The findings found no evidence that student environmental values moderate the relationship between sustainability and well-being. This suggests that person-organisation fit may not be applicable in the context of the match or mismatch between student and HEI environmental values. In other words, regardless of student environmental values and their match (or mismatch) with their HEI's environmental values, in the current sample, this did not influence the relationship between student perceptions of HEI sustainability and student well-being. It is possible that other factors, external to the environmental values, play a more critical role in the students choosing which HEI to attend, such as academic quality, location, cost or scholarship potential (Harahap et al., 2023). Therefore, while person-organisation fit theory has robust applications in organisational settings (Cooper-Thomas and Wright, 2013), its relevance may be limited when applied to the specific context of student and HEI environmental sustainability.

Practically, this research indicates to HEIs that improving their level of environmental sustainability could have positive effects on the well-being levels of their students. In other words, by working towards certain SDGs, for example, SDG 12 (responsible consumption and production), benefits may be noticed in progress towards meeting other SDGs (e.g. SDG3: good health and well-being). A single investment by the HEI, at a low monetary cost, into a bike storage facility could directly work towards SDGs 12–15, by encouraging a reduction in travel related carbon output, as well as SDG 3 by promoting a healthy lifestyle choice, cycling and the associated positive outcomes for both physical and mental health. This helps the HEI to solve key problems and ultimately benefits students, stakeholders and, more broadly, the environment.

Further, HEIs could improve both sustainability and student well-being by embedding environmental goals into their institutional mission, aligning organisation-wide efforts with the SDGs. HEIs could start by developing comprehensive sustainability strategies, appointing dedicated personnel or committees to oversee the implementation and ensuring regular communication with stakeholders through reviews and reports. Aligning with the new strategies, tangible investments such as installing bike storage facilities, adopting greener waste management systems and incentivising green transportation, can have immediate and visible impacts on sustainability and, in turn, potentially ameliorating student well-being. Furthermore, sustainability could be integrated into the curriculum to foster an environmental mindset, supported by workshops, events and student-led initiatives that promote sustainable practices across campus. To ensure these efforts benefit student well-being, HEIs could monitor their impact through regular surveys assessing both overall and study-specific well-being. These regular surveys could be incorporated into the HEI's institutional strategy and periodically reviewed to track improvements and define areas for refinement.

5.3 Limitations and future research

This study was not without limitations. First, its narrative views environmental sustainability as an inherently positive concept. Disorders such as climate anxiety are becoming more prevalent and disproportionately affect younger people and student populations. Those experiencing climate anxiety are more likely to feel heightened levels of anxiety when reminded of the threat of climate change, for example, when discussing environmental issues and/or the lack of action taken by people and societies (Sanson et al., 2019). Climate anxiety offers a potentially

fruitful avenue for future research, which could investigate whether this has moderating or mediating roles on the relationship between sustainability and student well-being.

Second, data were collected using a self-report, cross-sectional survey design. As such, participants only responded at one point in time and the authors were unable to test for causality or the long-term influence of perceived environmental sustainability on well-being. Given this study demonstrates positive relationships between well-being and sustainability, future research could explore this further through longitudinal and experimental designs. It would be advantageous for HEIs planning substantial environmental sustainability actions to measure student levels of well-being and perceptions of the HEI's environmental sustainability before and after any actions to evaluate their effects.

Finally, this study focused on perceived environmental sustainability, as opposed to actual environmental sustainability. Actual measurement of environmental sustainability is costly and lacks consistency, as it is generally self-measured through indicators chosen by the organisation, often based on those specific activities the organisation has chosen to focus on and ignoring others (Pham et al., 2020). This potentially leads to greenwashing by HEIs where they focus on presenting as environmentally sustainable organisations rather than following a wide range of environmentally sustainable practices (Álvarez-García and Sureda-Negre, 2023). Future research should investigate whether there are differences between perceived and actual environmental sustainability and if these influence student perceptions and well-being.

6. Conclusion

This paper identified two problems modern HEIs face: pressure to increase organisational sustainability and low levels of student well-being. The findings add to a growing body of evidence showing a link between HEI's perceived environmental sustainability and well-being; furthermore, this paper established that the relationship exists in HEI's student populations. The authors hope this paper will provide a starting point for research into the simultaneous increase of sustainability and well-being in higher education settings.

7. References

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Supplementary Information

Table SI

The 17 Sustainable Development Goals

Goal 1	No poverty - End poverty in all its forms everywhere
Goal 2	Zero hunger - End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
Goal 3	Good health and well-being - Ensure healthy lives and promote well-being for all at all ages
Goal 4	Quality education - Ensure inclusive and equitable quality education, and promote lifelong learning opportunities for all
Goal 5	Gender equality - Achieve gender equality and empower all women and girls
Goal 6	Clean water and sanitation - Ensure availability and sustainable management of water and sanitation for all
Goal 7	Affordable and clean energy - Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8	Decent work and economic growth - Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9	Industry innovation and infrastructure - Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation
Goal 10	Reduced inequalities - Reduce inequality within and among countries
Goal 11	Sustainable cities and communities - Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12	Responsible consumption and production - Ensure sustainable consumption and production patterns
Goal 13	Climate action - Make urgent action to combat climate change and its impacts*
Goal 14	Life below water - Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15	Life on land - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Goal 16	Peace, justice and strong institutions - Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal 17	Partnerships for the goals - Strengthen the means of implementation and revitalize the global partnership for sustainable development

Source. United Nations (2022), *The Sustainable Development Goals Report 2022*

Table SII

Zheng et al.'s Employee Well-Being Scale and modifications (in parentheses) made for the present study

Subscale	Item #	Item	CFA loading
Life WB	1	I feel satisfied with my life	.89
	2	I am close to my dream in most aspects of my life	.82
	3	Most of the time, I do feel real happiness	.85
	4	I am in a good life situation	.70
	5	My life is very fun	.83
	6	I would hardly change my current way of life in the afterlife	.83
Work (Study) WB	7	I am satisfied with my *work* (study) responsibilities	.74
	8	In general, I feel fairly satisfied with my *present job* (studies)	.90
	9	I find real enjoyment in my work	.90
	10	I can always find ways to enrich my work	.86
	11	*Work* (university) is a meaningful experience for me	.66
	12	I feel basically satisfied with my *work* (university) achievements *in my current job*	.84
Psychological WB	13	I feel I have grown as a person	.49
	14	I handle daily affairs well	.69
	15	I generally feel good about myself, and I'm confident	.92
	16	People think I am willing to give and to share my time with others	.43
	17	I am good at making flexible timetables for my (university) *work*	.64
	18	I love having deep conversations with family and friends so that we can better understand each other	.38

Note. Italics indicate words removed from items modified for the present study