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SDGs as a net or wedge for climate action? An international study of students' climate consciousness and awareness of SDGs

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Abstract

Purpose – This study aims to investigate how university students perceive and prioritize the United Nations Sustainable Development Goals (SDGs), and whether their climate consciousness and views on climate responsibility align with their awareness and prioritization of the SDGs. The findings inform the consideration of two pedagogical approaches – leveraging the SDGs as either integrative "nets" or strategic "wedges" – to enhance engagement with SDG 13, Climate Action.

Design/methodology/approach – A cross-national survey ($n = 388$) was conducted among university students in Argentina, Denmark, Italy, Spain and the USA. Using a Likert scale and rankings, the survey assessed participants' awareness and prioritization of the SDGs alongside inquiries into their perceptions of climate change and the people and institutions most responsible for addressing it.

Findings – Students recognize human-caused climate change and are concerned about its current and future impacts, yet a majority are unaware of the SDG frameworks and rank SDG 13 Climate action lower than other SDGs. They also have a moderate to low sense of personal responsibility and assign most responsibility to governments, wealthier nations and corporations.

Research limitations/implications – Our results reveal indicative patterns; however, the voluntary, university-specific sample limits generalizability. Future studies should expand the scope to other universities and may supplement the survey with qualitative methods such as project-based learning to explore the effectiveness of the wedge-based approach to SDG awareness.

Practical implications – By leveraging popular SDGs as "wedges" into broader sustainability issues, instructors can enhance SDG literacy, foster deeper engagement with climate topics and promote more effective, context-sensitive climate education. This approach could align pedagogy with student priorities while advancing meaningful integration of SDG 13 into higher education.

Originality/value – This study offers a globally relevant, data-driven framework that helps us consider two distinct pedagogical strategies to improve SDG literacy: presenting interlinked SDGs as nets that capture elements of SDG 13, or using highly valued goals (e.g. SDG 3 Good health and well-being) as wedges that offer deeper dives into specific SDGs that can later be linked to climate action.

Keywords Sustainable development goals, Higher education, Climate action (SDG 13), Environmental awareness, SDG pedagog, Pedagogy

Paper type Research paper

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1. Introduction

Despite the assumption that Sustainable Development Goals (SDGs) can help transform concern for sustainability into action (López López *et al.*, 2019; Žalėnienė and Pereira, 2021), there are persistent gaps between awareness and concrete, measurable outcomes (Maoela *et al.*, 2024). For example, many young people view climate change as an existential threat and seem ready to act; from climate strikes to divestment campaigns, university campuses can be hotbeds for targeted, *ad hoc* climate action (Reuter and Frick, 2024). Nevertheless, sustained participation in broader sustainability initiatives is often limited (Eroğlu *et al.*, 2025) and top-down institutional commitments and strategic sustainability messaging do not necessarily guarantee meaningful student engagement (Victoria Carrillo-Durán *et al.*, 2023).

The disconnect between motivation and implementation reveals an overlooked tension at the center of climate change education. Students and educators recognize the existential urgency of climate change and its relationship to sustainability efforts (Leal Filho *et al.*, 2023); however, most students do not see SDG 13 (Climate Action) as a priority and educators do not recognize the need for further training related for SDG 13 compared to other aspects of climate change education such as projections of future climate change, the economics of climate change and climate governance (Leal Filho *et al.*, 2021). In short, while students care deeply, the curriculum doesn't always meet them where they are. Understanding students' perceptions of SDGs is crucial to developing more replicable and responsive pedagogical approaches to teaching the SDGs and enacting broader campus sustainability.

Drawing on recent research, which corresponds with the results of our own international student survey, we argue that SDG-based instruction should consider two distinct approaches to SDG13 – the "net" and the "wedge." Scholars such as Rajabifard *et al.* (2021) and Buerkle *et al.* (2023) seem to view the 17 SDGs as an interwoven net, a system of challenges and opportunities that can be traced across curricula. In theory, this net structure is robust and holistic; in practice, the net may be too diffuse. Our findings suggest that, to follow the analogy, the mesh size of the net is too large to effectively catch SDG 13. Instead of capturing student attention, many students pass right through the net, leaving little behind in terms of SDG recall or relevance. We argue for an alternative approach that adopts high-priority issues and SDGs as "wedges" that drive into students' existing concerns and open pathways to broader climate engagement. This student-centered reframing prioritizes depth of engagement over breadth of exposure.

With the 2030 deadline approaching, those of us who have championed and worked to implement the 17 SDGs must begin to shift our focus toward assessment and revision of the goals. The deadline for the existing SDGs may be extended, the original goals may be expanded, or they may be trimmed to gain greater focus (van Vuuren *et al.*, 2022). This transitional moment presents an opportunity for universities to not only reassess SDG implementation but to innovate new, student-centered strategies for embedding climate action and sustainability into teaching practices. The SDGs offer a globally endorsed framework that, when reimagined through student priorities, can provide context-sensitive learning interventions.

In recent years, there has been a sharp increase in university commitments to the SDGs, and now thousands of universities worldwide have dedicated resources to specific goals, especially SDG 3 (Good Health and Well-Being), SDG 4 (Quality Education) and SDG 9 (Industry, Innovation and Infrastructure) (Xue, 2022). A more recent report by Times Higher Education reviews efforts by 2,152 universities worldwide and shows consistent academic focus on SDG 3 and 4 and increased focus on SDG 5 (Gender Equality), which includes

"universities' research on the study of gender equality, their policies on gender equality and their commitment to recruiting and promoting women" (Times Higher Education, 2024). That same report suggests that the bottom two SDGs, in terms of universities' research, teaching, stewardship and outreach, are SDG 13 and SDG 14 (Life Below Water) (Times Higher Education, 2024). No SDG should be left behind, but the persistent underrepresentation of SDG 13 is troubling – especially given the scale of the climate crisis and the university's responsibilities to address it.

At the university level, the real impact of the SDGs depends on how administration, faculty and students internalize them (Cuesta-Claros *et al.*, 2023). While prior studies assess student awareness or support for the SDGs, few investigate how students rank or prioritize different goals – and what these preferences imply for their ethical frameworks or climate behaviors. In addition to building upon these previous studies of SDG awareness and prioritization by expanding to include participants from different countries and contexts, the current study also linked the SDG with variables such as personal climate responsibility and beliefs about if and when climate change may harm communities. In doing so, it contributes to a more nuanced understanding of how students may be more effectively engaged with the SDGs and how educators may link the SDGs to climate action.

Therefore, this study builds on previous studies of youth perceptions of sustainability by using existing SDG awareness and prioritization to consider two distinct pedagogical methods to increase awareness and support for the SDGs, especially SDG 13. We examine whether the SDGs may best operate as nets – heuristics that weave together environmental, economic and social responsibility into a cohesive approach to climate action – or wedges – a focused entry point that highlights specific challenges and opportunities, allowing educators and students to begin with a distinct SDG (e.g. SDG 2 Good Health and Well-Being) and then later link it to broader sustainability concerns, such as SDG 13.

To begin to clarify these two possible pedagogical approaches, this study shares the results of a survey with 388 university students from Global North and Global South countries, including Argentina, Denmark, Italy, Spain and the USA. The survey results help us to address four guiding research questions:

RQ1. What demographic and institutional factors predict student awareness of the SDGs?

RQ2. Which SDGs do students prioritize, and does awareness level affect prioritization patterns?

RQ3. Does student awareness of the SDGs correlate with their frequency of thinking about climate change?

RQ4. How does SDG prioritization relate to students' attribution of responsibility for climate action among individual, governmental, corporate and international actors?

Our results indicate that students are concerned about climate change; they also demonstrate relatively low levels of personal responsibility for addressing climate change and low awareness of the SDGs overall. They consistently rank SDG 13 (Climate Action) below others such as SDG 3 (Good Health and Well-Being), SDG 2 (No Poverty) and SDG 4 (Quality Education). This presents a strategic opportunity: rather than starting with a net of SDGs including SDG 13 and hoping students appreciate the connections, educators might start with SDG 3 or SDG 4 – then draw connections outward. This wedge approach aligns closely with the pedagogical strategy described by Oljans and Mickelsson (2025), who use

wicked problems like local health challenges to help make connections among multiple SDGs. By engaging students in interdisciplinary case-based work, they show how local, tangible issues can serve as entry points to broader systems thinking. While not all wedges will lead directly to SDG 13, they can foster critical linkages and perhaps, over time, reanchor climate action at the center of sustainability education.

2. Literature review

Existing research on university students, sustainability and the SDGs presents a paradoxical picture: whereas some evidence suggests that SDG awareness correlates with enhanced engagement and civic participation, multiple studies document low levels of SDG knowledge among university students across diverse national and cultural contexts.

Two recent studies by Leiva-Brondo *et al.* (2022) and Cachero *et al.* (2023) surveyed undergraduate students in Spain ($n = 321$ and $n = 441$, respectively). The results of both studies suggest students have limited knowledge of the SDGs, with the first showing only 15.9% stating knew the goals well, and fewer than one-third reporting they had received SDG information in their university studies (Leiva-Brondo *et al.*, 2022); the latter study found "high level of satisfaction expressed by the students with receiving SDG training" (Cachero *et al.*, 2023, p. 9). Similarly, students surveyed in Italy showed awareness of the greenhouse effect and some international agreements, such as the Kyoto and Paris Agreements, but they had only a limited awareness of the SDGs and of different sustainability indicators (Smaniotto *et al.*, 2020). Focusing specifically on campus-based sustainability efforts at the University of Michigan, Cogut *et al.* (2019) found a clear link between sustainability awareness and behavior. The study also found that a higher level of student engagement in various campus activities (seen as participation) did not, as expected, have an amplifying effect on the link between sustainability awareness and behavior (Cogut *et al.*, 2019). This study highlights the gap: sustainable behaviors often stem from personal values and immediate environmental concerns, rather than from formal familiarity with the integrated global agenda of the SDGs.

Cross-national research also indicates that many students do not feel individual accountability or agency; instead, they mostly assign responsibility for sustainability or climate action to institutional actors such as governments, corporations or non-governmental organizations such as the United Nations (Hormio, 2023; Smaniotte *et al.*, 2020). Vaznonienė (2023) emphasized that young Europeans are concerned about the challenges of "nature protection and climate change," but they are "not specifically familiar with government documents or actions that analyze and assess climate change as a problem for societies" (p. 404). This preference for institutional responsibility may reflect broader psychological tendencies to maintain existing systems rather than challenge them (Eagle *et al.*, 2015; Feygina *et al.*, 2010). Indeed, psychological and economic barriers often constrain pro-environmental behaviors, especially when institutional or civic channels are weak. For instance, after completing a multidisciplinary and holistic course inspired by *Climate.now* material, students from Finland showed significant positive changes related to "knowledge on the science of climate change," but their knowledge on "how to mitigate climate change" remained low (Tolppanen *et al.*, 2022, p. 6). When it comes to wicked problems like climate change, students often place greater emphasis on government or corporate responsibility than individual action (Andersson *et al.*, 2022). This disparity between climate consciousness and motivation to take climate action may be further shaped by social class, political context and educational background (Hoekstra *et al.*, 2024; Kyriakopoulos *et al.*, 2022).

Select interventions related to SDG 13 have been effective. Recent intervention studies indicate that more targeted climate curricula can help bridge this knowledge–action gap.

Mooney *et al.* (2022) compared students enrolled in a "Climate and Climate Change" course at the University of Wisconsin–Madison with those in a more traditional meteorology class on "Weather and Climate." Their mixed-methods evaluation showed that students in the climate-focused course reported both greater conceptual understanding and significantly higher rates of behavioral change – averaging an estimated reduction of 2.86 tons CO_2 per year through altered consumption, travel and diet choices (Mooney *et al.*, 2022). Field *et al.* (2024) reached similar conclusions in Canadian teacher-education programs: participants in climate-education courses exhibited measurable growth in knowledge, urgency and personal efficacy, often initiating school-based or community projects after completion. These studies suggest that, when aspects related to SDG 13 are taught through experiential and agency-oriented approaches, university instruction can inspire climate action beyond awareness.

As the research shows, SDG awareness may foster civic engagement, even if evidence for its translation into behavioral change remains mixed (Liu, 2024; Sachs *et al.*, 2022). On a broader scale, universities have widely adopted the SDGs as frameworks for sustainability, governance and curricular innovation. For instance, integrating SDGs into coursework, both in the classroom and projects or service, has been linked to greater systems thinking and climate-health literacy (Cohen *et al.*, 2021). Halvorsen and Higgins (2020) also suggested that the goals can promote solidaristic, systems-oriented thinking or reinforce growth-driven, technocratic logics depending on how they are framed and implemented. These targeted interventions for SDG 13 are not the norm. In general, the SDGs are presented as discursive tools that can actively shape student worldviews, making their pedagogical framing crucial (de Jong and Vijge, 2021). However, institutional engagement often skews toward strategic communication – such as website branding or policy alignment. Fischer *et al.* (2021) argued that research on sustainable consumption communication related to SDG 12 "primarily focuses on the individual as the addressee of communication in their role as a private market actor" (p. 10). Even the strategic SDG communication on university websites is found lacking and should better use "video and image+text to show every SDG and to catch the attention of stakeholders in general and students in particular" (Victoria Carrillo-Durán *et al.*, 2023, p. 603). Top-down initiatives and institutional communication frequently fail to achieve meaningful student engagement with sustainability initiatives. Further insight is therefore needed on how students develop awareness of SDGs and of the different explanatory factors that guide how they prioritize SDGs, emphasizing, in particular, the understudied correlation between students' SDG awareness and their consciousness of climate change and climate action.

3. Methods

3.1 Survey creation and data collection

The data for this study were collected through an online survey conducted between October 2024 and March 2025 with undergraduate students enrolled at four-year universities in Argentina, Denmark, Italy, Spain and the USA. Our development of survey questions drew from previous studies of youth perceptions of sustainability and climate change (A. Leiserowitz *et al.*, 2021; Vaznonienė, 2023; Verschoor *et al.*, 2020). Nine experts reviewed and validated the survey instrument, assessing the clarity, relevance and importance of the 29 proposed questions (Aithal and Aithal, 2020). After receiving the experts' feedback and modifying some questions for clarity, we performed a pilot test with 28 participants. The results of the pilot test informed further refinements to ensure question clarity and appropriateness. To enhance comprehension, the survey was made available in English, Spanish and Italian. When the final instrument was complete, it was reviewed by the ethics committee at the first author's institution and confirmed to adhere to the guidelines of the Helsinki Declaration and personal data protection protocols.

Before completing the survey, all participants were presented with an outline of the study and a check box for providing informed consent (Survey instrument is available in supplementary data). A total of 404 respondents completed the survey, and, after excluding those over age 28 to focus on younger students, the final data set comprised 388 respondents.

3.2 Variables and constructs

The survey included a range of socio-demographic variables including gender, university, class and living environment (4 questions), perceptions of climate change and its potential local and global impacts (5 questions), which served as predictors for RQ1 and RQ2, alongside questions measuring participants' familiarity with the SDGs. To address RQ2's focus on SDG prioritization, participants ranked eight of the 17 SDGs in order of importance: SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 3 (Good Health), SDG 4 (Quality Education), SDG 6 (Clean Water), SDG 8 (Decent Work and Economic Growth), SDG 13 (Climate Action) and SDG 16 (Peace and Strong Institutions). These eight SDGs represent the three areas of social well-being, economic stability and environmental sustainability analyzed by Kleespies *et al.* (2023). For RQ3, we examined correlations between SDG awareness and climate consciousness through questions measuring perceptions of climate change and its potential local and global impacts (5 questions), alongside questions about responsibility attribution for climate action among governments, corporations, wealthy nations, NGOs and religious organizations. These RQ4 related responsibility questions specifically addressed SDG 13 implementation, allowing us to examine how climate action responsibility perceptions relate to overall SDG awareness and prioritization. Data was analyzed with SPSS version 29 and included multivariable regression analysis, Spearman's correlation coefficients and Chi-squared tests to examine relationships between variables and address the two primary research questions. The original survey and data set are available in supplementary data to ensure transparency and reproducibility.

4. Results

4.1 Demographic composition and climate change awareness by socioeconomic class

The participants represented a geographically diverse cohort, hailing from Europe, North America or South America. The gender distribution was less balanced, with 63.7% women, 34.8% men and 1.5% identifying as nonbinary or other gender identities. Most participants reported being brought up in urban environments (56.4%), with steady representation from suburban areas (33.5%) and a small percentage from rural settings (10.0%). Age and socioeconomic status were balanced. In total, 41.5% were 17–19 years old, 38.6% were 20–22 and 19.8% were 23–28 years old. Most respondents self-identified as middle class (40.5%) or upper-middle class (39.4%) with a smaller subsection from the two extremes of lower-middle class (15.5%) and upper-upper class (4.6%).

The overwhelming majority of the respondents "strongly agree" (55.2%) or "agree" (36.1%) with the statement that human activity is primarily responsible for climate change (Figure 1). A smaller subsection selected "neutral" (4.1%), "Disagree" 1.5% or "Strongly Disagree" (3.1%).

Although 4.6% of students rejected anthropogenic climate change, this is considerably lower than the estimated 14.8% climate denial rate in the US population (Gounaridis and Newell, 2024) and somewhat higher than the 2.3% average in Europe (Fraembs and Drobnič, 2024).

For the cognitive engagement with climate change based on "How often do you think about climate change" measured on a 4-point ordinal scale ranging from "Never or almost never" to "Daily," the majority reported "weekly" (30.7%) or "monthly" (31.7%) with a smaller group selecting "never or almost never," (25.3%). The small minority who thinks

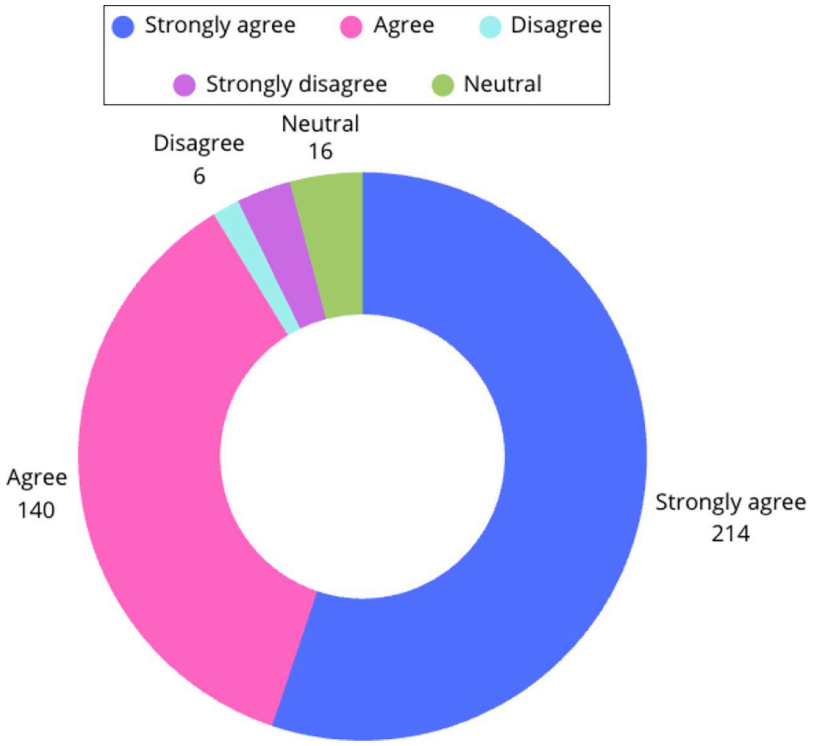

Figure 1. Responses (n = 388) to the statement: *Human activities are a major cause of climate change*
Source: Authors' own elaboration

about climate change "daily" (12.4%) suggests that, while baseline awareness exists within the cohort, persistent thinking about climate change remains limited.

When asked when climate change will harm people in their communities ("Currently experiencing harm," "In approximately 15 years," "In approximately 25 years" or "They will not be harmed") perceptions varied: A large subsection of 156 of the 388 respondents (40.2%) felt their communities have "been harmed for years" or are currently experiencing harm from climate change. In total, 32.2% anticipated harm by approximately 2040 and 22.4% by 2050. Only 4.4% asserted that their community would not be harmed by climate change (Figure 2).

In a bivariate analysis, social class emerged as the only demographic factor with a statistically significant influence on beliefs about when climate change will affect one's community (p = 0.0053). Students from lower-middle and middle-class backgrounds express significantly more urgency regarding climate impacts. In total, 36.7% of lower-middle class and 17.2% of middle-class students believe climate change is already harming their communities, compared to 20.9% of upper-middle class and 16.7% of upper-upper class students. Conversely, upper-middle (7.2%) and upper-upper class students (16.7%) are more likely to say that their communities will not be harmed, compared to just 1.9% in the lower-middle and middle-class groups. In general, students from different socioeconomic backgrounds hold different views on the urgency and proximity of climate threats, which may be influenced by differences in exposure, resources and climate-related vulnerability.

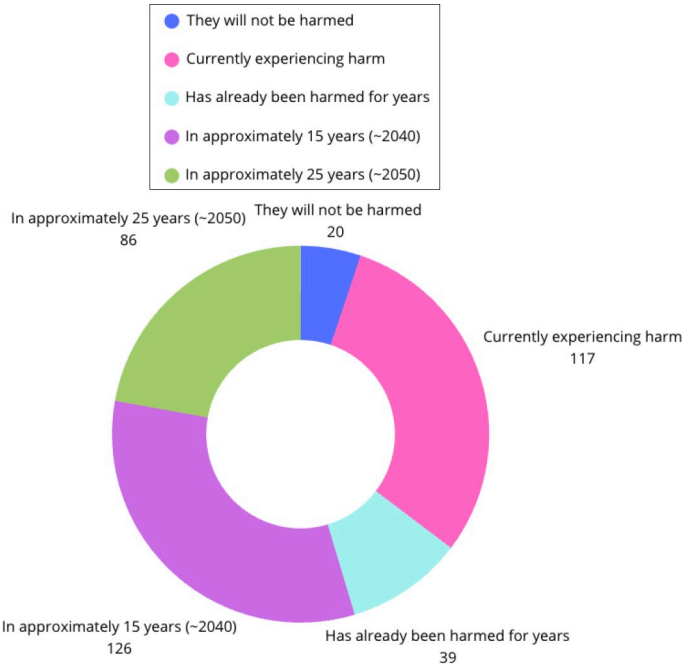

Figure 2. Answers to the question *When do you think climate change will start to harm people where you live?*
Source: Authors' own elaboration

Yet more specifically, our findings support extensive research suggesting that those of lower socioeconomic status in wealthier nations and vulnerable populations in the Global South (Ngcamu, 2023) stand to suffer the worst impacts of climate change.

4.2 Sustainable development goal awareness and prioritization

A significant finding of this investigation was the relatively limited awareness of the SDGs. In total, 41.7% of respondents reported they had "never heard of" the SDGs, while only 5% indicated advanced familiarity and regular engagement with SDGs through coursework or extracurricular projects. This is particularly noteworthy given the prominent integration of SDG frameworks within each of the institutions where the survey was conducted. Indeed, 97% of the respondents came from six universities, and three of these six are ranked in the top 400 out of 2,135 universities which contributed to the Times Higher Education SDG Impact Rankings (Times Higher Education, 2024) and a fourth, New York University, is not part of the Times Higher Education report but is ranked 52 globally in the QS World Rankings for Sustainability. Even separating the 53.8% of students (n = 209) who attend a university that boasts strong commitments to sustainability, we find that 32.5% report they have "never heard of the SDGs" and another 26.8% report being "not familiar with them." Students at sustainability-focused universities showed only modestly higher awareness (40.6% with basic to advanced understanding vs 34% overall).

In response to RQ1 – What demographic and institutional factors predict student awareness of the SDGs? – we find that institution and age had the most impact, although not in the ways we might have predicted. First, a univariable linear regression showed that the institution a

student attends is a statistically significant predictor of SDG awareness, B = −0.125, t(386) = −4.667, $p < .001$. However, even students at top-ranked sustainability institutions showed limited awareness, suggesting that institutional commitment alone does not translate into student knowledge.

To reveal additional predictors of SDG awareness, we conducted a multiple linear regression analysis with SDG awareness as the dependent variable and demographic factors (age, gender, environmental context, socioeconomic class), climate change awareness, climate-related behaviors and responsibility attributions as independent variables. Counter-intuitively, age showed a statistically significant negative correlation with SDG awareness. While we might assume that older students (aged 23 and above) would demonstrate greater awareness through accumulated coursework and degree progression, younger students (aged 17–19) reported higher SDG awareness. This inverse relationship held across multiple analyses: linear regression confirmed the effect, B = −0.195, t(386) = −2.520, $p = 0.012$, 95% CI [−0.347, −0.043] and Spearman's rho test corroborated the negative correlation ($\rho = –0.114$, $p = 0.024$, $n = 388$). Though the effect size is modest, the consistency suggests a genuine generational shift, likely reflecting increased SDG emphasis in primary and secondary school curricula following the goals' adoption in 2015. This interpretation aligns with research showing that students entering university with prior exposure to SDG-related themes demonstrate greater awareness and engagement with global challenges (Grotlüschen *et al.*, 2020). None of the other demographic factors, climate behaviors or responsibility attributions showed statistical significance as predictors of SDG awareness.

To address RQ2 – Which SDGs do students prioritize, and does awareness level affect prioritization patterns? – participants were asked to rank eight SDGs representing social, economic and environmental objectives. We calculated weighted frequencies of SDGs and saw consistent prioritization of SDG 2 (Good Health and Well-being), SDG 16 (Peace, Justice and Strong Institutions) and SDG 3 (Zero Hunger). SDG 2 was ranked in the top 3 position by 53% of students, while SDG 16 was placed as the most important priority, or ranked first, by 18% of students. Compared with the general lack of awareness, this may imply that students intuitively value health and well-being outcomes even without understanding how they fit into the broader SDG agenda. This emphasis on fundamental human needs may be influenced by contemporary global challenges including the COVID-19 pandemic, food insecurity and escalating health inequities.

SDG 13 (Climate Action) was one of the *least* prioritized SDGs in terms of weighted rankings, and notably, it did not receive heightened prioritization even among students who felt more responsibility for climate action. A regression analysis of the 114 respondents who ranked SDG 13 in their top three revealed that this choice was not significantly predicted by demographic variables, climate behaviors, responsibility attributions or SDG awareness. Again, those with more knowledge of the SDGs were not more likely to prioritize SDG 13. Only frequency of thinking about climate change (e.g. "daily" or "weekly") approached statistical significance ($\beta = 0.271$, $p = 0.051$), suggesting a modest relationship at best. This finding addresses RQ2 directly: while students prioritize health and well-being regardless of awareness level, SDG 13 remains deprioritized even among those most familiar with the SDG framework.

4.3 Determinants of climate change thoughts, concerns and responsibilities

First, it is worth noting that most respondents *do not* report significant personal responsibility for reducing climate change, indicating a critical area for educational and communication intervention. Instead, they see governments (88.2%), Wealthy Nations -G8- (82.8%) and corporations (90%) as either "fully" or "somewhat" responsible (Figure 3).

To address RQ3 – Does student awareness of the SDGs correlate with their frequency of thinking about climate change? – we implemented an ordinary least squares (OLS) regression models for three dependent variables:

(1) extent to which respondents feel personally responsible for reducing climate change (1 = not at all personally responsible, 10 = completely responsible);

(2) perceived local vulnerability and the expected timing of climate harm in respondents' communities; and

(3) self-reported frequency of thinking about climate change.

Temporal proximity of anticipated harm emerged as a meaningful predictor of climate consciousness. In one model, respondents who conceptualized climate harm as either present or imminent reported significantly more frequent thoughts about climate change ($\beta = 0.227$, $p < 0.001$). In addition, students who report thinking more often about climate change also reported significantly greater personal responsibility ($\beta = 0.427$, $p < 0.001$) and, as shown above, were also more likely to select SDG 13 as one of the top priorities. These results concur with Sloam *et al.* (2022), who suggested young people who regularly think about climate change tend to develop attitudes and values that mobilize them toward political and environmental action. We believe it is possible that the frequency of thinking (which may be measured as climate consciousness) can act as a catalyst for activism, even when formal knowledge of the SDGs is limited. Of course, students who value climate action may do so based on intuitive moral reasoning or psychological awareness rather than exposure to climate change thoughts or even familiarity with international policy frameworks. And, more critically, personal responsibility scores remained moderate overall ($M = 5.87$, $SD = 2.11$ on a 10-point scale), with only 21.9% of students rating their responsibility above 7. These results reinforce the notion that awareness and concern alone do not consistently translate into high personal accountability. Instead, climate

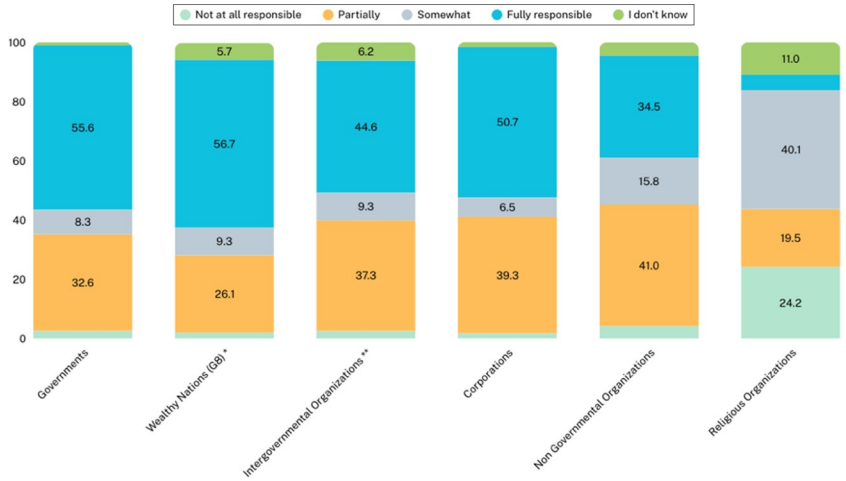

Figure 3. Answers to the question *Who do you think is responsible for climate change?*
Note(s): (*) Germany, UK, Japan, USA, China, Italy, Canada, France
(**) United Nations, Intergovernmental Panel on Climate Change (IPCC), Clean Energy Ministerial, etc
Source: Authors' own elaboration

consciousness is driven by perceived urgency rather than formal knowledge of international frameworks like the SDGs.

Addressing RQ4 – How does SDG prioritization relate to attribution of responsibility – we found that neither SDG awareness nor SDG prioritization significantly predicted responsibility attribution patterns. However, attributing responsibility to certain institutions did reveal distinct patterns in personal accountability. Students who believed that religious organizations should play a role in addressing climate change were more likely to report a stronger sense of personal responsibility ($\beta = 0.226$, $p < 0.001$), as were those who assigned responsibility to non-governmental organizations such as Greenpeace and the Clean Air Task Force ($\beta = 0.136$, $p = 0.010$). In contrast, students who placed greater responsibility on wealthy nations – specifically members of the G8 – were significantly less likely to feel personally accountable ($\beta = -0.129$, $p = 0.019$). This inverse relationship suggests that externalizing blame (or assigning responsibility) toward powerful international actors may dilute one's sense of obligation. Rather than motivating personal engagement, such attributions may foster a perception that climate action is the domain of distant or elite institutions – beyond the reach of individual or local influence.

To further assess these dynamics, a follow-up model examined a broader set of climate beliefs, including perceptions of efficacy (e.g. whether personal or community energy-reduction efforts are effective), institutional trust, SDG awareness and perceived local climate threat. This model identified three significant predictors of personal responsibility: belief that limiting one's energy use would help reduce climate change ($\beta = 0.302$, $p < 0.001$), belief in the effectiveness of community-level energy limits ($\beta = 0.184$, $p < 0.001$) and belief that national climate policies would improve public health ($\beta = 0.203$, $p < 0.001$). These findings suggest that personal responsibility is driven less by institutional blame or ideological framing, and more by a belief in the practical effectiveness of action – particularly when the benefits are localized or tangible, such as improvements to public health.

Exploratory models showed no statistically significant differences across the other variables . In other words, SDG awareness, SDG prioritization (including whether students ranked SDG 13 highly), climate behaviors and expectations about local climate harm or policy side effects (e.g. reduced employment) were *not* statistically significant indicators for responsibility. We may conclude that climate consciousness and awareness and prioritization of the SDG framework does not shape how students attribute responsibility for climate action.

5. Discussion and conclusions

This study investigated how students across five countries understand and prioritize the SDGs.

Our first two research questions (RQ1, RQ2) examined what factors predict SDG awareness and which goals students prioritize. Despite over 91% of respondents acknowledging human causation of climate change, 41.7% had never heard of the SDGs, with only 5% claiming advanced familiarity. In addition, the level of stated personal responsibility toward climate change presents a mean of 5.87 (on a scale of 1–10), suggesting the existence of an attitudinal-behavioral gap, in line with previous studies already mentioned in the theoretical framework (Cogut *et al.*, 2019; Hormio, 2023; Smaniotto *et al.*, 2020). Although institutional affiliation was a modest predictor of SDG awareness, no demographic variable, including class, gender or age (beyond a modest inverse effect), consistently predicted familiarity. These findings seem to challenge the "net" model of the SDGs as a universal heuristic integrating environmental, economic and social dimensions of sustainability. Instead, the disconnect

between awareness and prioritization favors reconceptualizing a few select SDGs as targeted wedges.

This is partly due to the fissures between SDG awareness and prioritization. Despite an overall lack of awareness, students often prioritized SDG 2 (Good Health and Well-being), SDG 16 (Peace, Justice and Strong Institutions) and SDG 3 (Zero Hunger). These goals reflect deeply intuitive values – health, justice and nourishment – rather than strategic familiarity with SDG frameworks. Even among students who prioritized SDG 13 (Climate Action), regression analysis showed that their SDG awareness, climate behavior and responsibility attribution scores were not significantly higher than their peers. Addressing RQ2 directly, these findings reveal that awareness level does not significantly shape prioritization patterns; instead, students gravitate toward SDGs that resonate with immediate, ethically driven concerns regardless of their familiarity with the broader framework. We believe these findings support the wedge approach: students may enter climate and sustainability discourse via other related challenges that *feel* more immediate or ethically resonant, rather than through the lens of global governance or SDG policy frameworks.

The third and fourth research questions (RQ3, RQ4) examined whether students' perceptions of the SDGs align with their climate beliefs and views on responsibility. The gap between high climate awareness and low personal responsibility scores (mean of 5.87 out of 10) aligns with Systems Justification Theory (SJT) which suggests people tend to defend existing systems rather than challenge them. Jost *et al.* (2004) established the foundational framework for SJT, arguing that individuals are motivated – consciously and unconsciously – to view prevailing social, economic and political systems as fair, legitimate and stable, even when they perpetuate inequality or environmental harm. Building on this foundation, research has indicated that such system-justifying motives are linked to denial of environmental realities and reduced commitment to pro-environmental behavior unless they are framed as compatible with the societal status quo (Feygina *et al.*, 2010). More recent work demonstrates how these motivations shape information processing and political identity: Hennes *et al.* (2016) showed that individuals who tend to more strongly justify systems recall climate science as less severe when they perceive environmental action as economically threatening and Dakin *et al.* (2024) identified how identity-protective and ideological factors reinforce climate obstructionism, as observed especially among conservative white males.

Combined with our findings, systems justification theory supports the pedagogical "wedge" approach. For example, Romulo *et al.* (2024) found that engaging students with values-driven frameworks of the food–energy–water nexus fostered personal engagement and systems thinking. Likewise, an international review by Leal Filho *et al.* (2024) suggested that institutional commitment to SDG-related education linked to locally or personally meaningful topics such as clean water and sanitation (SDG 6) and affordable and clean energy (SDG 7) leads to greater student participation. There are also examples of systemic change at the local level. Sachs *et al.* (2022) maintain that "sustainable development cannot be achieved without fundamental transformations in the way that societies produce and consume goods and services" (p. 241). Klees (2024) argues the SDGs are failing because of "the structures of patriarchal racial neoliberal capitalism" (p. 2) yet notes there are emerging alternatives offered by the Well-Being Economy Alliance, Doughnut Economics Action Lab and the World Social Forum (Klees, 2024). These kinds of local, practical alternatives for solving wicked problems through system change might be used to connect the micro-level of individual values and priorities to the macro-level systems change necessary to achieve all SDGs.

While the results reveal indicative patterns in student perceptions of the SDGs and climate consciousness, the relatively low sample size ($n = 388$) means the results do not make generalized conclusions. In addition, the practical implications of the wicked problems or

"wedge" approach for curriculum design and institutional strategy need further elaboration. Universities seeking to deepen sustainability engagement need to test the effectiveness of connecting individual goals – whether health, justice or community well-being – to clear individual and collective actions. Whatever forms this takes, we believe effective sustainability education must connect students' existing values to specific examples of SDG success and concrete action pathways. In practice, we call for educators to design entry-level courses around the most intuitively prioritized SDGs (health, hunger, justice) and then explicitly map how individual actions within these domains connect to broader climate goals and collective responsibility. Therefore, in the university classroom, the SDGs may ultimately serve best not as a comprehensive framework, but as entry points that align with the diverse ways students conceptualize their local and personal responsibility to creating a more sustainable world. In addition, noting the lack of SDG awareness, institutions might rethink how they measure SDG engagement to see if how their broader efforts are impacting students' capacity to identify concrete actions they can take within their prioritized sustainability domains and their understanding of how these personal commitments might scale to systemic change.

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Supplementary material

The supplementary material for this article can be found online.

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