

Discipline Guide:
Sustainability

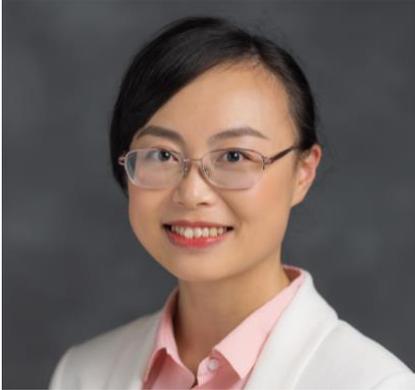
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Research with
International Students

About the authors



Hongping Zhang is a clinical assistant professor in the Department of Retail, Hospitality, and Tourism Management at the University of Tennessee, Knoxville. Her research centres around the nexus of transformative experiences and tourist memory. Currently, she focuses on their manifestation within education abroad, encompassing short-term study abroad programs, international internships, and international students. She examines how experiences gained through travel and learning abroad contribute to the development of sustainable behaviour, global citizenship, intercultural competency, and identity formation. She has also worked at Yellowstone National Park through the Work & Travel USA program. She is passionate about experiential learning through travel and hopes to bring the joy of learning and personal development to her students.



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About this series

Research with international students is an interdisciplinary field and there are a wide range of research disciplines which can add to our thinking about this subject. This series brings together global experts to present different research disciplines and their application to this research topic with the aim of encouraging more interdisciplinary thinking.

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Introduction

This discipline guide explores the intersection of sustainability and international education. As sustainability issues gain increasing global importance, scholars in international education would benefit from a deeper understanding and more effective application of sustainability concepts. This includes questions such as: How can we use international education to enhance students' sustainability awareness? And how can international education as a sector identify and mitigate its own harmful impact?

This guide begins by exploring the concept and the research field of sustainability. It then focuses on the dimension of environmental sustainability, offering insights into how international education scholars can apply an environmental sustainability lens to their work. Moreover, it will capture some of the prior work in particular as it applies to research involving international students and their sustainability perceptions, attitudes, and behaviours. Finally, the discipline guide proposes key questions and methodological approaches that could advance the field. It also provides a curated reading list to support those new to the field to start familiarising themselves with the relevant literature.

Sustainability as a concept

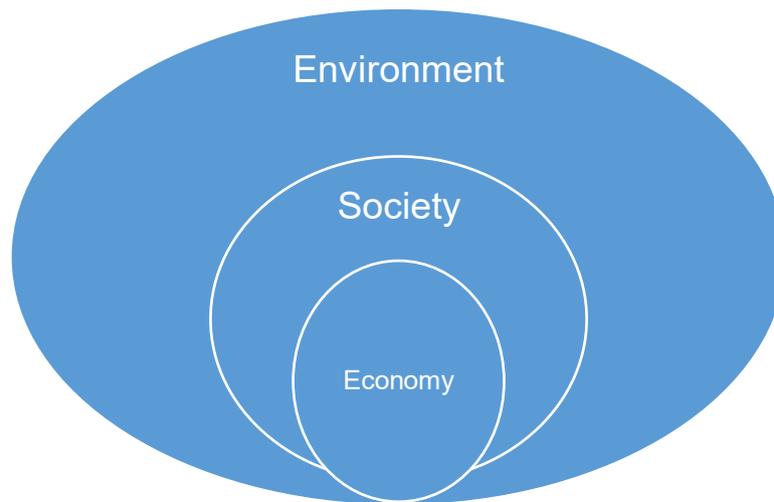
Sustainability is a multifaceted concept that broadly refers to our ability to live within planetary boundaries while meeting the needs of the people as well as pursuing economic activities. While sustainability is sometimes represented as a model of three main pillars or a Venn diagram consisting of environmental, social, and economic circles that partially overlap, a nested model in Figure 1 (page 3) offers a better representation. Here, the three dimensions are not separated and the nested model clearly emphasises the importance of environment for all activities in the other two spheres (Purvis et al, 2019).

Our Common Future report argues that sustainable development “meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987). This well-known definition highlights the importance of long-term thinking and intergenerational justice in how we use resources. [Krznarick's book 'The Good Ancestor' \(2021\)](#) further highlights the issues in the short-term lens that often dominates our current thinking and actions.

Sustainability, or lack thereof, as a lens can be used to explore the current status quo globally, nationally, or locally as well as consider the sustainability challenges in specific industries, sectors, and organisations. Globally, there are multiple different sustainability frameworks, standards, goals, and programmes. For instance, the UN

Sustainable Development Goals (SDGs) capture the global progress towards 17 goals, consisting of social, economic, and environmental goals, such as no poverty, life under water, and decent work and economic growth. Many of these goals are interdependent, but also multiple trade-offs exist; progress in one SDG goal can make progress in another SDG less likely (Pradhan et al, 2017), highlighting the challenges and tensions involved in sustainable development.

Figure 1. Nested model of sustainability



The research field of sustainability

Sustainability is an interdisciplinary research field that draws from various disciplines to explore the scope, implications, and solutions of sustainability issues. This can include the study of physical and biological phenomena, as well as the attitudes and behaviours of individuals, organisations, and systems. Consequently, the approaches are wide-ranging, and may involve scientific measurements and experiments, surveys, archaeological fieldwork, surveys, qualitative interviews, arts installations, and many other methods.

We require contributions from scientists across diverse fields to develop a comprehensive understanding of the current magnitude of many environmental challenges. For instance, researchers at the [Stockholm Resilience Centre](#) have quantified nine planetary boundaries and the extent to which humanity is already breaching seven of these thresholds.

Contributions from other fields of study are equally critical. For example, social scientists and psychologists provide pivotal insights into the factors that motivate or inhibit individuals and communities in adopting more sustainable behaviours while political scientists help us understand the mechanisms through which meaningful policy

interventions may be developed and implemented. Engineers design and advance technological solutions to address identified problems, and educational researchers can investigate the role of pedagogical approaches in fostering sustainable development competencies.

These examples are just a fraction of the various fields of research involved in sustainability inquiry. It is also important to note that many sustainability challenges, such as climate change, are widely regarded as ‘wicked problems’ due to their complexity and resistance to simple solutions (Rittel & Webber, 1973). As such, multi- and transdisciplinary approaches are often important for their comprehensive understanding.

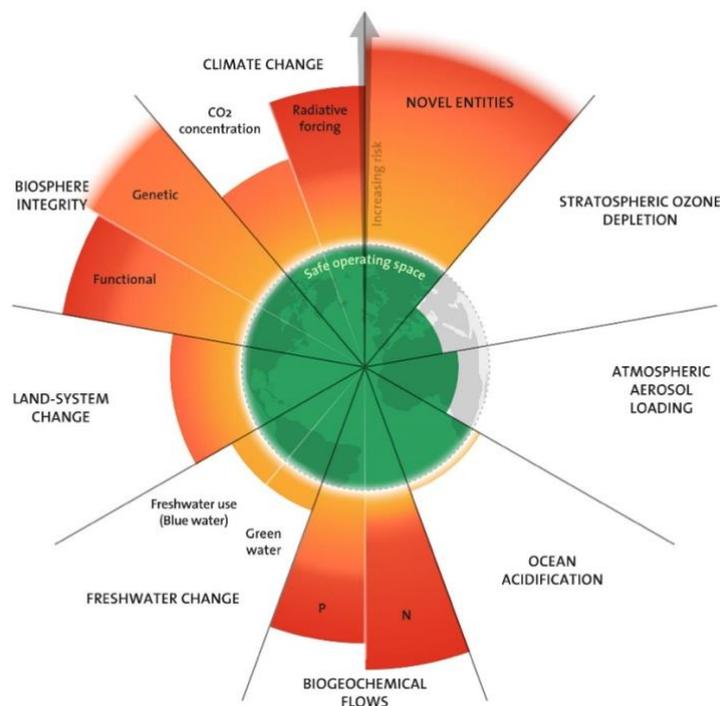


Image Source and Credit: Azote for Stockholm Resilience Centre, based on analysis Sakschewski and Caesar et al. 2025.

The intersection of environmental sustainability and international education

Why should it be studied?

What is the connection between international education and sustainability? Educational researchers have linked their work to various social sustainability indicators, such as quality education, poverty reduction, and gender equality. These themes are often explored without explicitly referencing the term ‘sustainability’. The same pattern is visible in international education research.

However, the intersection between environmental sustainability and international education remains relatively underexplored. McBride and Nikula (2023) identify two key approaches: evaluating the sustainability of the whole sector/programming and teaching sustainability through international education programmes.

The first approach applies organizational and system-wide lenses to the study of this topic. When examining environmental sustainability challenges within the international education sector, climate change has attracted the greatest attention in this area of study. International student mobility relies heavily on air travel, which carries a significant carbon footprint, and therefore international education-related travel contributes to the global climate crisis. The seminal work of Robin Shields (2019) calculated the global climate footprint of student mobility, estimating it to be at least 14 megatons annually. Other scholars have further contributed to the climate impact of international education, focusing on specific institutions or contexts (e.g., Arsenault et al, 2019; Robinson et al, 2023). Researchers have also discussed the various challenges and solutions for individual institutions, countries, and the global international education sector (McCowan, 2023; McBride & Nikula, 2023; Nikula et al, 2024) as well as explored the perspectives of non-student stakeholders, such as international education professionals (Campbell et al. 2023)

However, the remainder of the guide focuses on the second approach (i.e., research involving internationally mobile students), including an overview of some of the theories and methods available for those interested in this area of research.

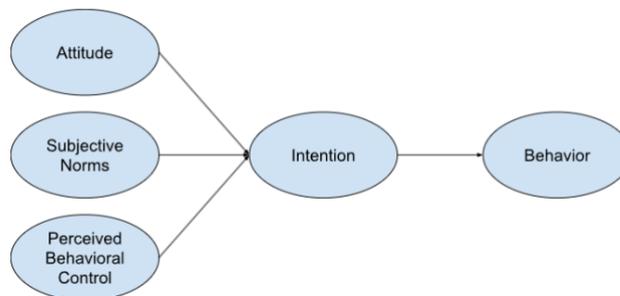
Theories and frameworks underpinning sustainable behaviours and study abroad

The Theory of Planned Behaviour is a psychological framework developed by Icek Ajzen in 1985 to explain and predict human behaviour. It has been widely used in the literature on sustainable behaviours. It can be applied to understand international students' engagement in sustainable behaviours when they travel or live in the host country as well as after returning from studying abroad.

The theory of planned behaviour posits that behaviour is primarily guided by an individual's intention to perform that behaviour, and three major factors determine the intention including attitude toward the behaviour, subjective norms, and perceived behavioural control. Attitude toward the behaviour refers to an individual's evaluation (positive or negative) of performing the behaviour. It is influenced by beliefs about the outcomes of the behaviour and the value placed on those outcomes. For example, if someone thinks protecting the environment is important, they are more likely to take the effort to do so. It is the intrinsic element that is driving the intention. Subjective norms instead are the external element shaped by perceived social pressure and expectations from others such as family, friends, and the society. For example, if a student participates

in a study abroad program that teaches about sustainable travel and is surrounded by other students who are passionate about sustainability and conservation, the student is more likely to travel in a sustainable manner at least during the program. Beyond willingness, people also have to believe that they are capable of carrying out certain behaviour. Hence, perceived behavioural control is the third element for people to engage in sustainable behaviour which refers to an individual's assessment of their ability to perform the behaviour.

Figure 3. Theory of Planned Behaviour (Ajzen, 1991)



The Theory of Planned Behaviour was not developed for understanding sustainable behaviour in particular, but has been widely applied in the sustainability literature. However, it has been critiqued for being overused, and lacking the practical value on explaining how to change people's behaviour considering the now widely acknowledged attitude-action gap in sustainable behaviour.

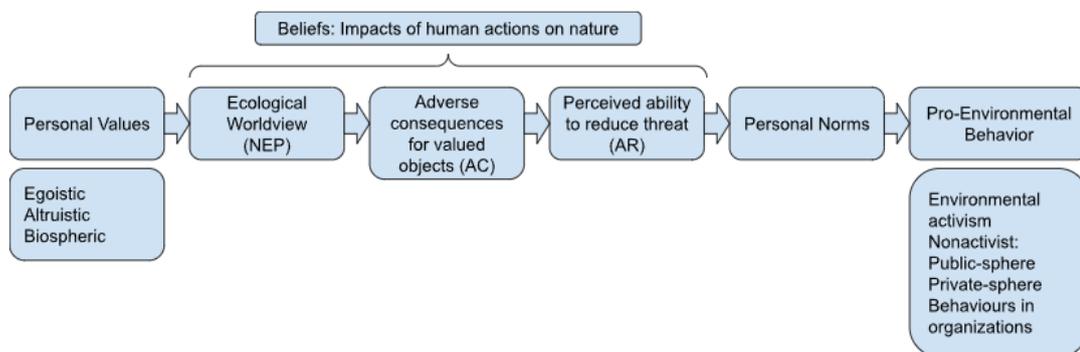
The Value-Belief-Norm (VBN) Theory (Stern et al., 1999, Stern, 2000) is a similar framework showing a sequential path leading to pro-environmental behaviours. Different from the Theory of Planned Behaviour, the VBN linked value theory and social movement theory to explain environmental movement at a societal level with an emphasis on the importance of nonactivists in a social movement.

In the VBN theory, values are core guiding principles that shape an individual's priorities. It consists of three subdimensions: egoistic (concern for oneself), altruistic (concern for other people), and biospheric (concern for the environment) values. Beliefs refer to one's beliefs about impacts of human actions on nature. Beliefs form a key link between values and the activation of personal norms. To be motivated to change, individuals must first recognize environmental problems and understand their consequences. This awareness must then be internalized by accepting responsibility, and perceived ability to reduce the environmental threat. In turn, such beliefs can activate a personal norm: a felt moral obligation or sense of duty to perform (or refrain from) particular actions, like recycling or saving energy. Unlike social norms, which are external expectations, personal norms are internalized standards rooted in one's values and beliefs about responsibility. When it comes to pro-environmental behaviours, Stern argues that not only environmental activism is key to an environmental movement, behaviours and people

who support such movements are also crucial. Therefore, three non-activist behaviours are also included in the model: Public-sphere behaviours, private-sphere behaviours, and behaviours in organizations.

The VBN theory has been extended and applied to the study abroad literature. Tarrant (2010) adapted the VBN model and developed a conceptual framework to explore the role of education abroad in nurturing global citizenship. He suggested that the pro-environmental behaviours can be further extended to represent different citizen types. This model can then be applied to understand impacts of education abroad experiences on the students' global citizenship development. Wynveen et al. (2012) applied this model and empirically tested it in a short-term study abroad context.

Figure 4. The Value-Belief-Norm (VBN) Theory (Stern, 2000)



Sustainable tourist behaviours

When international students study abroad, especially in short-term programs (8 weeks or less), their behaviour resembles tourists. If the students are not mindful about their behaviours, they can have negative impacts on the local community similar to a mass tourist. On the contrary, study abroad is an opportunity to educate and showcase sustainable travel styles so that students can learn and travel in such a manner in the future. The following section details the four dimensions of sustainable tourist behaviours which should be instilled in international students.

Chandran et al. (2021) defined sustainable tourist behaviours as “activities of a tourist that enhances cultural exchange and promotes social integrity, helps in economic development of a region and provides minimal damage to the environment as the individual is engaged in environmental recreation and learning” (p. 985). Based on this framework, they developed a four-dimensional scale encompassing social, cultural, economic, and environmental aspects of sustainable tourism behaviour.

Socially sustainable tourist behaviours refer to those that emphasize tourists' support for the well-being and development of local communities. Tourism can have both positive and negative social impacts on host communities. Poorly planned tourism may lead to

Issues such as restricted access to local resources, increased crime, and even displacement of residents.

Culturally sustainable tourist behaviours are manifested by respecting the local culture and facilitating cultural exchange. Although host-guest interactions can foster cross-cultural understanding (Canavan, 2016), this outcome is not guaranteed. When tourists disregard local customs, it can lead to negative encounters, reinforcing stereotypes and generating local resentment. In striving to meet tourist expectations, destinations may also experience cultural commodification and a loss of authenticity (MacCannell, 1973). Over time, such developments can erode community pride and contribute to acculturation, where locals begin to adopt tourist behaviours (Archer et al., 2012).

Economically sustainable tourists are mindful about their expenditures and support the local economy. Although tourism is often associated with economic growth, its benefits do not always extend to local residents or communities (Garrigós-Simón et al., 2015). One major concern is economic leakage, which occurs when tourism revenues flow out of the destination—commonly due to foreign ownership or heavy reliance on imported goods. Additionally, local communities may see limited gains when wages remain low and the cost of living rises in tourism-driven areas (Archer et al., 2012).

Environmentally sustainable tourist behaviours can be broadly defined as tourist behaviours that are not harmful to the natural environment. Environmental sustainability has long been a central focus especially within ecotourism, nature-based tourism, and tourism in protected areas (Esfandiar et al., 2022). Earlier studies primarily examined the antecedents of environmental behaviours such as personal values, social norms, and emotions (Juvan & Dolnicar, 2016). More recently, research has shifted toward identifying effective interventions (Demeter & Dolnicar, 2023).

Chandran et al. (2021) operationalized this sustainable tourist behavior model and developed a scale to measure it. Zhang et al. (2024) adopted this scale and confirmed that study abroad memories can enhance participants' future sustainable tourist behaviors through enhancing their global citizenship identity.

Transformative Learning Theory

Transformative learning theory has been widely used in education abroad because education abroad allows students to observe and reflect on other cultures as well as their own which provides them with the context to engage in transformative learning. It can be used as a guiding framework for curriculum design. Furthermore, transformative learning theory is particularly useful for examining sustainability education in study abroad programs as changing sustainable behaviours often requires a shift in values, beliefs, and norms (Bell et al. 2016; Strange & Gibson, 2017).

Transformative learning theory, developed by Jack Mezirow in 1978, describes a process by which adults fundamentally change their perspectives, assumptions, and beliefs

as a result of critical reflection and new experiences. Unlike traditional models focused on acquiring knowledge, transformative learning emphasizes the transformation of a learner's frame of reference—the underlying structures that shape how people interpret experiences and make meaning of the world. It is a framework that has been widely used in understanding learning in the context of education abroad.

Mezirow argues that we all interpret reality through mental structures called frames of reference, shaped by our culture, experiences, and prior beliefs. When learners are encouraged to question and critically examine their own assumptions, beliefs, and perspectives, they may experience what Mezirow called “disorienting dilemma,” after which we may change the way we think, hence achieving transformation. Mezirow outlined a series of phases through which transformative learning typically unfolds: 1. disorienting dilemma, 2. Self-examination, 3. sense of alienation, 4. relating discontent to others, 5 explaining options of new behaviour, 6. building confidence in new ways, 7. planning a course of action, 8. knowledge to implement plans, 9. experimenting with new roles, 10. reintegration.

Examples of methods available to study the impact of international education on sustainability awareness and behaviours

Research about international students and sustainability can include various methodological approaches. This section provides insights into a range of research designs and methods as well as progress in the literature on teaching about sustainability through study abroad.

Short-term, faculty-led programs are the most commonly chosen form of study abroad among U.S. students. In the late 2000s, a group of international educators collaborated to create a series of field-based short-term faculty-led programs with a deliberate focus on sustainability education. The programs are offered in summer and visit Australia, New Zealand, and Fiji. Over the years, Tarrant and colleagues have conducted multiple studies to examine the effectiveness of these programs on fostering students' sustainable attitudes and behaviours as well as global citizenship.

Three of these studies employed a pre- and post-test design to assess changes in environmental values using the Value-Belief-Norm (VBN) model, reporting increased environmental citizenship following program participation (Tarrant & Lyons, 2012; Tarrant et al., 2014a; Wynveen et al., 2012). Subsequent research by Tarrant, Rubin, and Stoner (2014, 2015) used a 2x2 factorial design to examine the impact of course location and course content on environmental citizenship, environmental consumer behaviour, and global perspective development. They identified a significant impact of the interaction between location (study abroad versus residential) and course content (sustainability courses versus other courses). More recently, Landon et al. (2019) conducted a similar quasi-experimental study to compare climate change attitudes between participants in international and residential courses (Landon et al., 2019). Results showed that study

abroad participants were more likely to express belief in climate change, with female students demonstrating greater environmental concern than their male peers.

In addition to environmental dimensions, sustainability education should also address its socio-cultural and economic components. A qualitative study by Bell et al. (2016) investigated the same set of faculty-led study abroad programs through the lens of transformative learning theory and found that beyond developing “a new connection with the natural world,” the students also developed heightened sociocultural awareness and a greater understanding of economic dimensions related to sustainability. Importantly, many participants expressed a desire to incorporate sustainable practices into their daily lives and future careers (p. 396).

One notable limitation of the previously discussed studies is their reliance on data collected immediately after program completion. As Tarrant, Rubin, et al. (2014) observed, a persistent challenge in study abroad research is the lack of delayed post testing. Addressing this gap, Zhang and Gibson (2021) conducted interviews with alumni approximately five years after their participation in the same set of programs to examine the long-term impact of study abroad on program participants’ sustainable attitudes and behaviours. Their findings revealed that the shift toward a more sustainable mindset endured over time and was evident in participants’ career choices, everyday behaviours, and travel practices.

Studies that focus on students’ sustainable behaviours and apply true longitudinal methods which track students over years have been rare. Zhang and Gibson (2021) conducted a qualitative study with 31 study abroad alumni, five years on average after their participation in short-term, field-based, faculty-led sustainability programs. They found that participants maintained a sustainable mindset, with impacts in three domains: everyday life, professional development, and travel behaviours. To engage students with varying interests in sustainability, the authors suggest programs should: (1) for those already interested, emphasize emotional connections such as place attachment and work with local environmental organizations; (2) for the less interested, teach ecological science to link daily actions with environmental impacts; and (3) for all students, provide explicit ways to apply sustainable practices in daily life.

Recommendations for future research

Long-Term Impact of Sustainability Education on International Students’ Behaviours

While the long-term impact of studying abroad has been documented in some large-scale retrospective longitudinal surveys (Dwyer, 2004; Norris & Dwyer, 2005), studies that focus on students’ sustainable behaviours and apply true longitudinal methods which track students over years are rare. Future studies are recommended to explore the impact on students’ sustainability attitudes and behaviours.

Teaching Sustainability Intentionally or Incidentally

Broadly speaking, education abroad can foster sustainable attitudes and behaviours in students, as international experiences often enhance their global awareness—an essential foundation for addressing inherently global challenges. This connection has been empirically supported by Zhang et al. (2024), who found that memories of education abroad can strengthen students' global citizenship identity, which in turn promotes more sustainable behaviours. However, the common “just do it” approach to study abroad—assuming that mere exposure to other cultures leads to transformation—has been critiqued. Simply placing students in a different cultural context does not necessarily change their understanding of other cultures or influence their sustainability behaviours. In response, intentional programs that explicitly teach sustainability have shown to be more effective. Such strategies for integrating sustainability into education abroad across a wide range of academic disciplines are still underexplored.

Final remarks

This discipline guide is intended to provide a thoughtful contribution to ethos interested in the intersection of sustainability and international education. It should not be regarded as a comprehensive review of all relevant literature, but rather as a starting point for considering the integration of sustainability within the context of international education.

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