Internationalisation, Sustainability and the contested environmental impacts of International Student Mobility

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Purpose
This paper seeks to stimulate the nascent research agenda on the environmental sustainability of the ongoing mushrooming of international student mobility (ISM). The Higher Education (HE) system in the UK and elsewhere is increasingly predicated upon the hosting of international students. Whilst this drive towards internationalisation undoubtably has multiple benefits, little attention thus far has been paid to its potentially very considerable environmental impact. The drive for internationalisation within HE thus potentially sits at odds with ambitions and strategies to promote sustainability within the sector and beyond.
Methodology
In-depth interviews with 21 students and representatives of 14 university international offices offer insights into how the environment features in the decisions that young people and HE institutions make with regards to partaking in and promoting education related mobility.
Findings
The results find that students take environmental considerations into account when undertaking education related mobility, but these aspirations are often secondary to logistical issues concerning the financial cost and longer travel times associated with greener travel options. At the institutional scale, vociferously championed university sustainability agendas have yet to be reconciled with the financial imperative to recruit evermore international students.
Originality
This paper identifies a thus far neglected contradiction within HE whereby the sustainability agenda that it so rightly espouses is potentially undermined by the drive towards internationalisation. The paper utilises the anthropause concept to consider the future environmental sustainability of ISM.

Keywords: anthropause, environmental sustainability, higher education, international student mobility, internationalisation.

Introduction

The focus of this paper is the environmental impact of International Student Mobility (ISM) and how it relates to potential contradictions within Higher Education agendas on internationalisation and sustainability. Globally, the volume of students in higher education who were internationally mobile stood at 0.3 million in 1963, growing to 2 million by 2000 and then tripling to 6 million by 2019 (UNESCO, 2022). The expansion of ISM has been mirrored by a burgeoning body of literature into the phenomenon (Gümüş et al, 2020). Within this evidence base, ISM is widely regarded as being beneficial for those who engage in it and the educational institutions and wider societies which host international students. Previously international mobile graduates receiving higher wages and more rapid wage growth than their non-mobile counterparts (although this relationship is more nuanced than is widely assumed, Van Mol et al, 2021). International students often pay substantial tuition fees, cross-subsidising teaching and research and benefit the wider society through stimulating the demand and supply sides of economies (Gamlen, 2020). In the UK alone, international tuition fee income sits at around £6 billion per year and represents about a fifth of the income received by universities (Office for Students, 2022). International students benefit the wider economy to the tune of £29 billion per year (HEPI, 2021) and a recent study of the 2016-17 cohort of international students calculated that they contributed £3,173 billion in tax (HEPI, 2019). Accordingly, governments, the Higher Education (HE) sector and individual universities have enthusiastically developed and pursued internationalisation strategies, of which recruiting international students is a core component (Spencer-Oatey and Dauber, 2021).

The centrality of ISM to the viability of universities has led some to raise concerns regarding the sustainability of the HE sector in a financial sense (Lai et al, 2019; Manzoor, 2020). The covid-19 pandemic and international tensions could potentially lead to longer-term repercussions for the main ISM receiving states such as the USA, UK and Australia in terms of attracting international students (Gamlen, 2020). For example Li and Ai (2022) have put forward the creditable thesis that the pandemic and geopolitical instability could represent a watershed moment whereby the previously significant flows of Chinese students overseas for education shrinks, with considerable implications for tertiary education systems globally. Aside from the role of ISM in supporting but also precariatising the sustainability of the tertiary education system in financial terms, questions have been raised regarding ethical components of the internationalisation agenda and the extent to which these can be considered sustainable.

Ramaswamy et al (2021) and UNESCO (2022) emphasise that, despite its growth in recent decades, ISM remains a highly exclusive practice. Van Gaalen et al (2020) draw attention to the dominance of Western states and the English language within ISM as resulting in a potential re-colonisation of education. Financial barriers and the standardisation of educational programmes conceivably therefore reduces diversity within ISM rather than fosters it (Ilieva et al, 2014). Whilst the promotion of ISM on the part of host institutions and states has thus been critiqued on financial and moral grounds, the environmental sustainability of ISM has been largely neglected (Campbell et al, 2022; Shields, 2019). This is remarkable, given that the carbon emissions generated by millions of international students travelling to and from university are likely to be considerable. The objective of this research is to draw upon in-depth interviews with students and International Offices at UK universities to shed light on and stimulate debate on the environmental ramifications of ISM. This intervention is timely given that the scientific community and numerous states have declared a climate emergency, with the most recent IPCC report calling for urgent and drastic action to avert catastrophic climate change (Arias et al, 2021). This issue also relates to multiple UN Sustainable Development Goals, most notably access to quality education and urgent action to tackle climate change. The HE sector, amongst others, has responded to the climate emergency by developing and promoting numerous sustainability initiatives (Universities UK, 2021), although these have been open to accusations of greenwashing (Jones, 2012). The following questions are addressed in this analysis;

1: What are the perceived environmental impacts of ISM?

2: How do these environmental costs relate to the wider benefits associated with ISM?

3: Is there an inherent contradiction between internationalisation and sustainability within the Higher Education system?

4: Looking forward, how might the nexus between internationalisation, sustainability and ISM evolve?

Whilst the focus of this analysis is the UK, the findings have broader relevance. The UK case is particularly interesting as it was the first country to charge full-cost fees to international students and thus to position the recruitment of them for the purposes of income generation as a key component of internationalisation (de Wit and Altbach, 2021). Other English-speaking countries subsequently pursued this commercial model, followed by others increasingly

adapting a market approach to international student recruitment (*ibid*). Another intriguing aspect of the British context is that, at the time of the research, the UK had recently formally left the EU, meaning that European students were now subject to full international fees. This has implications in terms of the geography of ISM and its environmental sustainability, as many British universities experienced a decline in European applicants, thus further entrenching their reliance on core 'markets' further afield. The latest figures indicate that 605,130 international students were studying in the UK in 2020-21, three-quarters of whom were non-EU (Universities UK, 2022). Students from China are by far the largest cohort of international students (143,820), followed by India (21,305), Nigeria (21,305) and the USA (19,220). The UK therefore contains nuances in relation to internationalisation but is also totemic of the prevalent shift towards commercialisation within it. The following section offers a review of the few studies that have grappled with the issue of the environmental sustainability of ISM and proposes a framework through which it might be conceptualised.

Literature review

The fundamental dilemma that motivates this research is aptly highlighted by McCowan in his assessment of the impact of universities on climate change: 'an ever-present contradiction is between the sustainability principles espoused by universities and their internationalisation strategies – usually involving extensive travel of students and staff with corresponding carbon emissions' (2020, 36). Some scholars and policies have recognised this paradox and put forward well-reasoned proposals to address it (Dey and Russell, 2022; Arsenault et al, 2019). However these studies and strategies have tended to focus on the travel practices of staff within the HE sector rather than on student travel, which is quantitively much more significant. Others have reflected critically on the environmental consequences of the broader ways in which contemporary tertiary education systems operate (Bautista-Puig et al, 2022; Dvorak et al, 2011). Glover et al (2017) lament that being globally mobile is essential for the career progression of academics and the internationalisation strategies of their institutions, yet this sits directly at odds with their professed sustainability policies. Similarly, Dey and Russell (2022) ruefully note academia's position as a carbon-intensive profession, and the lack of scrutiny that this receives. Given that air travel could account for up to a third of a university's overall carbon footprint (Arsenault et al, 2019), the mass shift towards online activities that was necessitated by the covid-19 pandemic has been understandingly viewed as offering a route towards a more environmentally sustainable tertiary education sector. For example Universities

UK (2021), the umbrella body representing British universities, has identified six lessons from the pandemic that could aid in making universities more sustainable: travel policies based on environmental outcomes rather than cost; direct flights prioritised when flying; use of sustainable web browsers; making virtual vivas permanent; continuing with virtual open days. Whilst these interventions are to be welcomed for drawing attention to the potential contradiction between internationalisation and sustainability, there is a stark absence of studies that have attempted to explicitly elicit the views of universities and students regarding this tension or empirically assess the environmental effects of ISM (Shields, 2019; Davies and Dunk, 2015; Campbell et al, 2022). This limited evidence base is discussed below.

Davies and Dunk (2015) surveyed 673 international students studying in the UK and used information relating to their air travel to highlight the challenges associated with accounting for the carbon generated by ISM and the extent to which their host institutions should be considered responsible for these emissions. They also note that gains made by reducing estate emissions are likely to be dwarfed by growing ISM, but that encouraging or coercing students into taking fewer flights may be counterproductive, given that it would likely lead to even more air travel in the form of visits from friends and family. The thorny issue of responsibility for the environmental aspects of ISM is a theme which features prominently in the findings of the research described in this paper.

The analysis by Shields (2019) is the most comprehensive assessment of the greenhouse gas (GHG) emissions from travel associated with ISM to the UK. He contends that GHG emissions associated with ISM increased from 7.24–18.96 megatons in 1999, to 14.01-38.54 megatons of CO2e (equivalent) per year in 2014, depending on different scenarios. To put this into context, in 2018 the national annual emissions of Ireland was 37.01 megatons of CO2e and Slovenia 14.05 (World Bank, 2022). This stark increase in GHG emissions is unsurprising given that ISM has also grown drastically over this period. Shields warns that global emissions from ISM have increased at a much greater rate (6.4%-7.1%) than GHG emissions in general (2.2%). Echoing concerns about inequalities in access to ISM (Ramaswamy et al, 2021; UNESCO, 2022), Shields finds that students from developing countries account for only 38 per cent of the GHG emissions associated with ISM. On a more positive note, per capita

emissions are decreasing owing to a growth in intra- relative to inter-continental ISM (Shields, 2019).

Shields concludes his analysis by making a call for future research to 'examine how the contradictions between aspirations for higher education as an agent of change for sustainable development and its dependency on unsustainable economic and social models is manifested and negotiated at the individual and organizational levels' (2019, 601). This, he argues, can be pursued through an enhanced understanding of how students, academics and university administrators reconcile and negotiate the aspiration for universities to be forces for sustainability, whilst also dependent on revenue from sources that are environmentally unsustainable. This study seeks to respond to this call by investigating how those who are involved in undertaking and promoting ISM perceive and respond to this contradiction. This builds on a recent paper by Campbell et al (2022), which involved interviews with professionals in the field of international education in the USA. In their analysis, interviewees expressed logistical and ethical challenges reconciling the conundrum between international education and climate change, leading the authors to call for greater acknowledgement of 'the emotional tax of working in international education in a warming planet' (Campbell et al, 2022, 15). The issue of guilt for the environmental costs of ISM and the question of responsibility for these effects is considered in the empirical section of this paper.

The research described in this paper took place against the backdrop of the global covid-19 crisis, and the findings suggest that this event had clear immediate, but also more uncertain longer-term effects on patterns and processes of ISM, and thus its sustainability. For this reason the notion of the pandemic as a watershed moment for ISM in terms of its scale and geography (Li and Ai, 2022) is a prominent theme in the empirical sections of this paper. A potentially fertile means of framing and conceptualising the short-term (but also perhaps longer lasting) pauses in human mobility brought about by the pandemic is the anthropause and anthropulse thesis, developed by the biologist Christian Rutz (2022). The anthropause refers to the sudden and dramatic reductions in human mobility associated with the covid-19 lockdowns. On the other hand, the anthropulse refers to a possible rebound in human mobility levels beyond pre-pandemic baseline levels. Whilst Rutz is careful to emphasise that events associated with these concepts (covid-19 but also the Black Death and the Chernobyl disaster) often bring great

human tragedy and suffering, they also have significant implications for the functioning of the Earth's system. The relevancy of this conceptual framing for consideration of the sustainability of ISM is that it allows for both optimistic (covid-19 as a catalyst for positive change) and pessimistic (pent-up demand for ISM and a rapid return to business as usual) interpretations of this era-defining crisis. The theme of how ISM may evolve going forward, and what this means for environmental sustainability, will thus be an important feature of the analysis. This research also hopes to contribute to the recent expansion of the anthropause concept beyond the natural and into the social sciences (Turnbull et al, 2022; Searle et al, 2021).

Methodology

This research included an online survey of 144 international and domestic students across 23 UK universities, which was used to gauge their attitudes and actions related to the environment and to estimate their carbon footprints. The survey results are not included in this article (see Nicholson and McCollum, 2022). However the findings discussed here are based on follow up in-depth interviews with 21 of the student survey respondents, which were undertaken in order to generate a richer understanding of whether and how environmental sustainability shapes their education related travel. Senior officials within International Offices at 14 British universities were also interviewed to elucidate the extent to which the internationalisation and sustainability agendas are at odds with each other. These interviews are the focus of most of the empirical material in this paper.

The online survey ran from mid-November 2021 to the end of February 2022 and included a retail voucher prize draw to incentivise participation. After pilot testing, it was disseminated by contacting student societies at multiple universities and asking them to share it amongst members. Stratified purposeful sampling based on share of international students within the student body was used to try and gauge views from a diverse set of institutions. The survey was designed in three sections. The first section asked participants' demographic characteristics and degree information. The second section was the largest and included questions focused on travel, diet, energy consumption, and retail behaviours. At the end of this section the estimated carbon emissions associated with the respondent's answers were displayed to the respondent. This carbon footprint 'score' was placed in the context of the other participants of the survey. The final section explored the environmental attitudes of the students

and how these ranked in their future life decisions. The findings from the survey need to be understood within the context of its modest sample size, however they do provide a broad indication of whether and why the carbon footprint of international students differs from domestic students. The survey findings can be summarised as: international students generate more carbon than domestic students (the equivalent of a return flight between London and New Delhi) and this is due to mobility between place of residence and place of study (Nicholson and McCollum, 2022). Using an opt-in option, the survey also served as a recruitment tool for 21 in-depth online interviews with students, covering eight universities in total. As with the survey, most participants were female. Thirteen were international students (8 domestic) and twelve were undergraduates (9 postgraduate). Eleven different nationalities were represented in the interviews, although the sample was not representative of the geography of ISM to the UK (7 were from the EU, 6 were non-EU and 8 were domestic students). The interviews typically lasted 30-60 minutes and covered the following themes: university experiences, travel behaviours and rationale behind them, reflections on their carbon footprint as estimated by the survey and views of ISM from an environmental perspective and of the sustainability practices of their host university.

The interviews with the senior staff (usually the Head of International Student Recruitment) in International Offices are perhaps the most illustrative component of the study methodology, as they provide insights into the views and strategies of universities towards international student recruitment and reflections on the extent to which these are seen as being at odds with the sustainability drive within the sector. A total of 14, typically hour long, online interviews were conducted. Purposive sampling was used in an attempt to include a diverse sample of HEIs according to level of prestige and extent of internationalisation. This approach is based on that developed by Findlay et al (2017) in recognition of the role of internationalisation strategies in shaping patterns and processes of ISM and of the varying desire and ability of universities to attract international students. A reasonable balance between higher and lower ranking institutions was achieved (Table 1), although, perhaps inevitably given the topic of the research, international universities are overrepresented in the sample. The interviews centred on the following themes: trends in the scale and geography of ISM at their institution, strategy with regards to international student recruitment, environmental impacts of ISM, the sustainability policies of their institutions and whether there is a tension between them and internationalisation. Both the student and international office interviews where transcribed

immediately after they occurred and the transcripts analysed and thematically coded using NVivo software. Pseudonyms are used to protect the identity of interviewees.

Table 1: Profile of International Office interviewees

	International	**Less International**
	Overseas students account for more than 30% of the student body (2020/21 HESA data)	*Overseas students account for 30% or less of the student body*
Prestigious *Ranked as a Top 20 UK University (Guardian 2021 Ranking)*	• Tom • Amy & Jo • Adam • Jennifer • Mark • Frank	• Martin • Joey
	International	**Less International**
	Overseas students account for more than 25% of the student body*	*Overseas students account for 25%* or less of the student body*
Less Prestigious *Not ranked as a Top 20 UK University*	• Miranda • Nancy • Chris	• Bill • Tim & Hailey • Marie

*The threshold for International is set slightly lower for the Less Prestigious universities, as they have fewer international students.

The sustainability of ISM: student perspectives

The themes from the student interviews chime with the widely documented attitude–behaviour gap that commonly prevails in the context of decision-making and climate concern (Higham et al, 2016). Those interviewed were all well informed regarding anthropogenic climate change and expressed concern about it. However, a paucity of practical and affordable alternatives meant that international students found themselves reluctantly reliant on air travel, as typified by Jessica.

'The problem for me mostly with air travel is that there's no good alternative. So, if there was a train that was cheaper than air travel, I would absolutely take it. I have the time, I don't mind going by train at all. I actually love riding trains… But since that doesn't exist, and especially between countries, the connections are so poor. I think that's the main issue, and then having flight tickets that are just so cheap. Yeah, I think for students, there's very little room to do it differently.'

Jessica, German postgraduate student

An absence of realistic alternatives to air travel results in a great deal of personal confliction for many international students. This has echoes with Campbell et al's (2022, 15) plea for sensitivity regarding the 'emotional tax' that comes with being climate conscious but also engaged with international education.

'I'm kind of torn apart sometimes. Especially when I was taking the plane between like, "okay, I have decided to go to the UK, but now I have to take the plane each time I want to see my family" and that is against my beliefs. So, I can't say anything about like, the broader picture, I felt it was a bit like that kind of dissonance, where yeah, I wanted to go there to meet new people, but now I am forced to take these decisions that are very bad for the environment.'

Jeremy, French postgraduate student

The interviews do however present grounds for optimism in that the enforced constraints on mobility brought about by the pandemic might have longer lasting positive effects on how and why students travel (international and domestic alike). The quote from Juliet below aligns with the reasoning that the covid-19 induced anthropause (Rutz, 2021) may in fact have longer term benefits in terms of sustainability. As will be discussed later, this was also a prominent theme in the International Office interviews.

'During the pandemic I did fly. I went to Central America for a volunteering trip. And that was really good. But it kind of made me look at things that I could do, maybe closer to home, and kind of the value behind going. So, like I've always said, "oh I want to travel and go to different places around the globe". But now I'm thinking maybe I just go because there's something there that I want to do rather than just travelling for the sake of travelling if that makes sense. So, I think being a bit more critical about stuff like that'.

Juliet, British undergraduate student

Aligning with calls within the literature regarding the imperative to consider the positive as well as negative environmental impacts of ISM (Shields, 2019; Tyers, 2021), many students acknowledged the costs but emphasised the environmental benefits of overseas study.

'So when it comes to the plane trips, that's of course quite a thing - so many people come from so many different countries… And, yeah, it must be quite an impact. But I think it's worth it. For the multiculturalism, but also, it is some kind of exchange of ideas. I think, for example, people have different environmentalism in the different countries, different kinds of awareness. And that's the one thing - bringing ideas, bringing the skills of discussion and being able to discuss with the family about all the things you learned from the different countries or your friends.'

Lilly, German undergraduate student

A final prominent theme in the student interviews was the issue of where responsibility lay for the environmental costs of ISM. Anne asserts that this is the responsibility of the institutions which promote and benefit from it. As will become evident in the following section, this is contested by universities.

'I think it would be good if the university did [something], considering it tries to recruit international students a lot. It's very, very proud of its international student body, and it really encourages international students to come. So, I think there should be some form of, like, restoration is that the right word, restoration, like a balance.'

Anne, British undergraduate student

The sustainability of ISM: university perspectives

This section discusses the views of those with responsibility for strategies on behalf of their institutions towards international student recruitment, the extent to which these clash with sustainability goals and how these dynamics might evolve going forward. Unsurprisingly, there was universal consensus amongst interviewees that ISM was a positive phenomenon and that it should therefore be encouraged. Whilst non-pecuniary factors, such as improving overall student experience and possible future research connections were mentioned by many, all respondents conceded that financial imperatives underpinned their university's stance regarding international student recruitment.

'Why do we want International students? There are two main drivers from my perspective, one is internationalisation and the other is financial. And the internationalisation side, I think is hugely, hugely important [but] if you actually got someone talking entirely frankly, and honestly, would it outweigh the financial? I'm not sure… education as a commodity is popular and valuable, and we can sell it as a country. And we rely on our reputation as a high quality, highly regulated education sector as a commodity, and that helps fund our overall system and the research and everything else that current government funding doesn't do. So it plugs that gap in delivery of what a high level research institution needs. It's where that funding comes from'.

Mark, high ranking, international

The quotation from Mark above confirms the already widely recognised reliance of universities on international fee income to plug funding gaps (Gamlen, 2020). What is of greater relevance in the context of this study is whether internationalisation is seen as being at odds with efforts to promote sustainability within the HE sector, and if so how this paradox is defended. As the quotation from Miranda suggests, most universities are cognisant of the environmental impacts of ISM but have (yet) to take tangible steps towards addressing them. This ties in with concerns expressed in the literature with regards to whether or not universities should have responsibility

for the emissions generated by ISM and also the likelihood of gains made by greening on-campus operations being overshadowed by the scale of in-bound student international air travel to those campuses (Davies and Dunk, 2015).

'I don't think we've thought as far ahead to the mitigations for the huge volume - 600,000 or so - international students coming to the UK each year, and all the flights and carbon emissions that go with that, I think we're aware that that has to be addressed at some point. But at the moment, the kind of first target, I think in universities is thinking about kind of direct emissions from our own activities, rather than kind of, you know, third area emissions of student mobility.'

Miranda, not high ranking, international

Most interviewees acknowledged that this situation created a difficult contradiction between sustainability and internationalisation, with the latter consistently trumping the former. Tim's quote also highlights the futility of on-campus sustainability measures without action on air travel and the need for a mechanism to gauge the emissions generated by ISM to better inform strategies, a point returned to at the end of this paper.

'I think we are an institution that has done a lot. We've had some conversations, there's an awareness of it. Where I think the sector as a whole has to move to is "you need to recruit X students to the campus next year", the conversation needs to be "how do we measure the impact of that on the climate?" And then once we're able to measure it, how do we assess whether it's a good thing to continue to do or not? And if it's a good thing, what steps can we take to mitigate and minimise the impact of that? And I think we're not yet at the stage of having those conversations… do we offset some of that? Do we encourage students to take fewer flights in some way? I think there's absolutely an agreement that we need to, but we are not yet having that conversation, at least at the level we should be… is saying "no paper cups on campus" actually going to tangibly rack up against flights? We need a way to measure the whole thing. And as far as I'm aware, there is nothing at the moment that will enable us to do that. So, we're left feeling that flights are just wrong, but we can't really measure that'.

Tim, not high ranking, less international

The findings thus far have revealed that it is financial need that largely determines the international recruitment strategies of British universities, that there is recognition that this sits at odds with the sustainability agenda but that few significant steps have been taken to proactively address this contradiction. Returning to the notion of the longer-term effects of the anthropause, and chiming with the student interviews, around two-thirds of the interviewees emphasised that many of the changes in recruitment necessitated by covid-19 have been retained post-pandemic. Whilst the quotation from Nancy serves as grounds for optimism concerning the environmental impacts of ISM, Bill's point more closely aligns with the less

positive anthropulse notion and is a reminder of the dominance of financial considerations in institutional strategies.

'From a carbon perspective, and COVID was the perfect excuse to really do this, you don't need to get on the plane and go to Vietnam four times a year to recruit students, and you're doing something wrong if you have to do that. We've got colleagues locally employed that do that for us, and therefore reduce our need to get onto planes. A - it is expensive and B - for the carbon footprint'

Nancy, not high ranking, international

'I think this has been a pause in our normal working life and it will be much harder to go back to what we used to do and the type of travel that we were used to. This kind of mass adoption of Zoom and Teams will help more of the spurious travel in the future… Will we go back to travel? Yeah, we will go back to travel. It will be a competitive driven thing, ultimately. Climate is part of the conversation, but ultimately, it is the bottom line that will drive tactics.'

Bill, not high ranking, less international

It is noteworthy that the covid-induced changes in travel have focused on the activities of international offices and academics, rather than the much more quantitatively significant student body. Given the competitiveness of the 'market' for international students, universities were thus weary of encouraging or coercing their students to take drastic steps towards reducing their carbon footprints.

'The primary consideration for us is still going to be the student experience, and we would consider the student experience before we're looking at the climate impact, but that is part of the consideration… from the institutional perspective, student experiences is always going to come first. But there's probably an interesting dynamic between the institution and the student in that the student is probably more conscious of climate issues than the university at the moment [so] rather than supply, it might be demand that sort of drives change there'.

Adam, high ranking, international

As such, some interviewees expressed concern that the widespread shift towards constraining staff travel within the sector was misplaced.

'There's been a few presentations at conferences and discussions over the past few years about whether student recruitment teams at universities should be engaged in flying over to China or the USA or Singapore or whatever to recruit students. My feeling has always been that that pales into insignificance, if, by doing that, the whole goal is to recruit a whole load more students who are only going to be flying over to the UK in turn. So I think it's missing the point really. And that if an institution like ours wants to have an impact on the carbon footprint of flights, what you really need to focus on is student number targets… rebalancing away from China… Having said that, realistically, it's just not going to happen'.

Tom, high ranking, international

The HE funding model creates a structural reliance on ISM and it is unlikely that this will change in the foreseeable future. Therefore, as noted by Adam and other interviewees, the best hope for environmental sustainability within ISM may come from the 'consumer's rather than suppliers of international education. However, hinting at the attitude-behaviour gap displayed by student participants, some interviewees were sceptical regarding the true appetite for radical change amongst students, meaning that universities lack sufficient incentive to enact it.

'Young people are very conscious of these issues. You could argue, probably not enough yet. But I would say, for me, it will start to shift when I get a student rock up to an exhibition in China and say, you know, I really want to come to your institution, but I'm concerned about this as an area, what do you do about it? How can I offset it? Do you discount my fees if I travel by train? I have never had a conversation along those lines with a student… But once we start to see students asking that type of question, and being impressed by a university that says that this is an important thing for them, and that universities can start to use that as a recruitment tool or a brand building tool, then I think we'll start to see bigger change'.

Tim, not high ranking, less international

These findings have demonstrated how the financial imperative to engage in ISM on the part of the HE sector, and the scale and geography of it, results in a considerable disjuncture between well intentioned university sustainability and internationalisation agendas. Furthermore, the results hint at little realistic prospect of significant change in the foreseeable future: the HE funding landscape necessitates ISM on a grand scale and student interest in sustainability has not yet extended to the realm of suppressing international travel for education related mobility. This leaves the options of either greening ISM, most realistically through less international air travel, or enhanced offsetting of its environmental costs. Given that ISM is often dominated by intercontinental mobilities and universities are understandably reluctant to coerce their students to travel less frequently, the former option faces considerable barriers. Likewise, the delicate issue of who should shoulder the significant financial burden of offsetting the carbon created by ISM is contested and has yet to be seriously discussed within the sector. Notwithstanding the non-pecuniary challenges and controversies regarding offsetting (Gifford, 2020), the financial costs associated with it would be very considerable. A very crude estimate using a popular website (mycarbonplan.org) at the time of writing (September 2022) quotes a carbon offset price of £6.50 per tonne. At this rate, the 38.54 megaton estimate for ISM to the UK created by Shields (2019) for 2014 would cost over £250 million a year to offset. The actual cost is likely to be higher than this, given that Shields' estimates were conservative and ISM has increased since 2014.

Given the likely prohibitively high costs of offsetting the emissions generated by ISM, some interviewees expressed hope that the transition towards online learning that was necessitated by the covid-19 pandemic might have unintended benefits going forward. Distance learning and transnational education (TNE) were muted as having benefits in terms of not only environmental sustainability but also widening participation in education. These perspectives fit with the case put forward by UNESCO (2022) for virtual student mobility in a post-pandemic world as a means of making education more accessible whilst simultaneously negating the negative environmental effects of ISM. However, as Marie notes, there is reason to suspect that remote learning could simply end up complementing rather than substituting ISM, given that it would be orientated towards those unlikely to engage in education related mobility regardless.

'We're in the process of rolling out a new strategy. It does include some diversification away from traditional kind of on-campus, bringing students to the UK recruitment, looking at more TNE, and looking for models that allow access to our courses, which don't require a student to be necessarily in the UK. Again, there is a sustainability angle to it. But there probably is also an opening the market up to students who couldn't come here, whether that's fees wise, visa wise or somebody that's working'.

Marie, not high ranking, not international

Conclusions

This analysis has highlighted difficult and unresolved tensions between internationalisation and sustainability. In this section, their implications for the Higher Education sector and the research agenda on this issue are considered. The limitations of the carbon audit conducted as part of this research (Nicholson and McCollum, 2022) mean that the extent of emissions associated with ISM remains largely unknown. Given that the conservative estimates computed by Shields (2019) equate the emissions from ISM to the UK with the total emissions from Ireland, it is striking that so little is still known about the scale of this phenomenon. Whilst the outcomes of such an assessment might make uncomfortable reading, it is imperative that an accurate picture of the environmental consequences of education related mobility is developed, so that this can be considered in relation to the myriad of benefits that it brings. This knowledge is also necessary for the development of effective, fair and transparent policies regarding 'greening' ISM and offsetting the emissions it generates. A carbon audit will only be reliable if it is based on a large and representative sample of universities and their students. As such, bodies such as the Office for Students and Universities UK would do well to initiate and coordinate the first comprehensive audit of ISM to the UK. A further benefit of creditable

carbon audits of ISM is that they could inform and feed into global agreements aimed at combatting climate change. This suggestion was initially raised by Shields (2019), who noted that standard United Nations Framework Convention on Climate Change (UNFCC) reporting methods do not attribute aviation emissions to individual nation states. A shift towards acknowledging the uneven geography and benefits of ISM could potentially inform fairer climate agreements, given that lower income countries receive but also produce the lowest quantities of ISM and thus emissions.

Related to this point, this research underlines the importance of debates regarding environmental sustainability and ISM taking an inequalities perspective. From an institutional internationalisation strategy perspective, international students might be considered 'equal' in the sense that their fees are the same regardless of whether they come from a nearby or very distant country. However they are clearly 'unequal' in terms of environmental impacts. Carbon emissions are in general highly spatially and socially uneven, and these disparities map onto inequalities in the geography of ISM and who gets to partake in it (Shields, 2019). There is thus a risk that making ISM more environmentally sustainable might simply render it even more exclusive. This is because constraining the expansion of ISM, particularly intercontinental mobility, and greater offsetting are the two most obvious short-term solutions to concerns about its environmental sustainability. However these solutions, whilst offering clear environmental benefits, might see only those students who are able to afford to travel in greener ways or offset their emissions be able to engage in education related mobility. Likewise, better resourced institutions in wealthier countries would be better equipped to shoulder the financial burden of offsetting emissions from incoming students and supporting greener longer distance travel. This research shows how students and those responsible for promoting ISM are aware of and often feel carbon guilt regarding the emissions associated with their activities. Despite interviewees being relatively privileged, certainly on the global scale, they all faced considerable financial barriers to travelling or recruiting internationally in a less environmentally costly manner. It is therefore important to recognise that, even within the context of the UK, structural constraints involving transport systems and HE funding models mean that the capacity of students and institutions to act in more environmentally friendly ways varies greatly. Recognising the urgent need for action in the face of the climate emergency, it is therefore also important to keep in mind that blanket, restrictive policies towards ISM could simply exacerbate existing social and spatial inequalities in education

related mobilities and carbon emissions. In this respect, internationalisation and sustainability need not be mutually incompatible, as the existence of satellite campuses, distance learning online courses and joint degrees demonstrates.

Technological improvements to make the aviation industry carbon neutral or changes to how HE is funded remain some way off. This means that the environmental costs of ISM are likely to persist in at least the short to medium terms. However this research posits that there are a number of relatively straightforward and cost effective to steps that could be taken now. One is enhanced on-campus activities and support for students over the holidays within academic years. This could help to prevent longer distance travel for short periods. As well as having environmental benefits, these provisions could have wellbeing benefits for the many students who already do not travel 'home' and thus remain on-campus during holidays within term time. This research has highlighted that concern about sustainability is coupled with widespread uncertainty regarding the environmental costs of ISM and contestation regarding responsibility for them. Incorporating measures of sustainability (including relating to ISM) into international and domestic university ranking systems could be an important step towards greater transparency in this respect, given that such indicators are currently absent from mainstream ranking systems (Bautista-Puig et al, 2022). This could be a significant step as it could create more tangible incentives for universities to invest in sustainability, given the influence of rankings in shaping student decision making. It could potentially also increase awareness amongst students and allow them to make these choices, should they wish, based on transparent information regarding the sustainability of their potential host university. This could create further demand-led incentives for universities in this respect. Lastly, distance learning and transnational education have been around for some time, but have been greatly accelerated by the covid-19 pandemic. There is scope for research to consider the environmental implications of the wider adaptation of these modes of learning. Might they, as Marie suggests, simply complement rather than substitute existing ISM, or do they represent the beginnings of a more fundamental step change in the scale and geography of ISM? This research finds some enthusiasm for these approaches but also an enduring desire amongst many students and universities to continue to engage in the conventional model of on-campus learning.

A final point worth reflecting on is the prominence in the interviews of the notion of the pandemic as being a gamechanger for ISM and thus its relationship with environmental sustainability. Covid-19 has been a catastrophic health and economic crisis, but it has also brought about some short and perhaps also longer-term environmental benefits. It is still too early to say whether the anthropause will be sustained going forward or whether an anthropulse can be expected as human activity and mobility responds to the lifting of restrictions. Hope for the former can be derived from the apparent reduction in flippant travel on the part of students and university staff and the mass adaptation of remote learning technologies. On a less positive note, it is likely that universities will continue to rely on the fees from international students and that this will continue to take priority over environmental considerations. The environmental sustainability of ISM post-pandemic is therefore an area that is ripe for further study and debate.

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