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**To cite this article:** K. Sian Davies-Vollum, Chris Ribchester, Esther Yeboah Danso-Wiredu & Debadayita Raha (2023): Virtual mobility to enhance intercultural competencies for a more sustainable future, *Innovations in Education and Teaching International*, DOI: [10.1080/14703297.2023.2224770](https://doi.org/10.1080/14703297.2023.2224770)

**To link to this article:** <https://doi.org/10.1080/14703297.2023.2224770>



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Published online: 15 Jun 2023.



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## Virtual mobility to enhance intercultural competencies for a more sustainable future

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### ABSTRACT

The UN locates education at the heart of the process to achieve a more sustainable future and deliver the 17 Sustainable Development Goals (UN-SDGs) by 2030. Within this context, this paper outlines the experience of designing and delivering an international virtual mobility workshop which brought together university students from the UK and Ghana. It offers a critical evaluation of the extent to which the workshop's objectives were achieved, through comparison of pre- and post-workshop survey results, with a particular emphasis on changing levels of understanding of the UN-SDGs and the development of key intercultural competencies. The discussion highlights positive trajectories of change in student learning, and the challenges of delivering workshops of this nature. It is concluded that such challenges can be embraced as learning opportunities and that the associated discomfort and uncertainty is important to facilitate impactful learning experiences.

### KEYWORDS

UN-Sustainable Development Goals; intercultural competencies; virtual mobility

## Introduction

The Education for Sustainable Development (ESD) for 2030 framework (UNESCO, 2020) aims to achieve a more just and sustainable world and thus contribute positively to delivering the UN Sustainable Development Goals (UN-SDGs). ESD aims to empower learners with the appropriate knowledge, skills, values and attitudes to address the complex and multi-dimensional global challenges that are facing society. Working to resolve these sustainability challenges (Lönngren & van Poeck, 2021) requires multiple perspectives and understandings that cut across not only disciplinary boundaries (Jones et al., 2010) but also cultural boundaries.

Culture influences the ways in which an individual experiences their environment and how they view and approach sustainability in different contexts and situations. Values, attitudes and behaviours around sustainability may vary between cultural regions due to different histories and traditions (Berglund et al., 2020) and underlying

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value differences can contribute to differing views and priorities when it comes to addressing and achieving the UN-SDGs (Berglund & Gericke, 2016; Herremans & Reid, 2002). The importance of transculturality, the changes that cultural interactions generate, has been recognised in ensuring the success of sustainable development projects (Filho & Przybylowicz, 2019). In essence, cross-cultural comparison and discourse has the potential to facilitate a more holistic understanding of the UN-SDGs and invites the examination of the things that are 'taken for granted' (Stigler et al., 2000).

The importance of cultural specificity in ESD is emphasised in numerous international policy documents e.g. UNESCO (2006). Thus, delivering ESD in Higher Education in ways that encourage and develop cross-cultural perspectives of students is essential to a holistic and realistic understanding of sustainability and the UN-SDGs. There are few published studies that have examined the significance of cross-cultural perspectives in ESD. These have focused on establishing the difference in attitudes and perceptions of sustainability in students from different countries (Berglund et al., 2020; Boeve de Pauw & Van Petegem, 2011; Loureiro & Kaufmann, 2014). A limited but increasing number of studies have explored the consequences of bringing together students from different cultures to consider issues of sustainability (e.g. Caniglia et al., 2016; Ferreira-Lopes et al., 2022). This paper responds to the call to examine the questions of 'which types of [intercultural] learning experiences and activities, both formal and non-formal, are most effective and for which audiences, contexts, environments?' and how these experiences can be 'made available to those who need intercultural competence the most, or who may not be able to have access to such learning opportunities?' (Deardorff, 2015, p. 4).

Cross cultural learning has become an important pedagogical objective in twenty-first century education (Myers et al., 2005; Reynolds et al., 2017) with a need for collaborative opportunities that bring together individuals from different cultural backgrounds (Machwaite et al., 2021). Nikiforova and Skvortsova (2021) contend that 'intercultural competence should be considered as an obligatory competence of any future professional, regardless of majors and education programmes' (p. 4). Deardorff (2015) recognises that there is some ambiguity in the term intercultural competency and that a variety of terminology is used, however the definition 'effective and appropriate behaviour and communication in intercultural situations' (Deardorff & Jones, 2012, p. 287) remains heavily used in the literature, along with the associated Intercultural Competency Model (Deardorff, 2006), which is used as the theoretical frame for this paper. This model breaks down intercultural competency into three components: (1) attitudes, including respect, openness, curiosity and discovery; (2) skills, including listening, observing and evaluating; (3) knowledge and comprehension, including cultural self-awareness and understanding the worldviews of others. Together, these can precipitate the desired internal outcome – a frame of reference shift, including developing an ethnorelative perspective – in turn, facilitating the desired external outcome – effective communication and behaviour in intercultural situations.

The development of intercultural competency should be underpinned by an active and collaborative pedagogy (Reynolds et al., 2017), and these were key principles adopted by the authors in designing the workshop intervention outlined here. Learning with others is likely to be more impactful than just learning about others. Reynolds et al. (2017) continue that the design and implementation of transformational intercultural experiences is likely

to require some degree of 'bravery'. This accords with Hill et al.'s (2019) call to adopt 'courageous pedagogies' which necessitate entering 'pedagogic borderlands' which are likely to be unfamiliar and, at times, uncomfortable spaces for staff and students.

Uhlenwinkel (2017) determined that two preconditions are necessary for successful intercultural communication: (1) participants should either already possess or be ready to develop a cross-cultural understanding; (2) participants will need something that they all think worthwhile to discuss. According to Bird et al. (2020), intercultural experiences with the greatest potential for transformation are characterised by four main elements: (1) complexity – creating the possibility of competing or multiple explanations; (2) affect – experiences which stimulate a strong emotional response; (3) intensity – encouraging concentration and focused attention; (4) relevance – being of personal significance to the learner. Both papers highlight the general pedagogic principle about the value of learning experiences which are seen by students to have real-world applicability (Cameron, 2011).

Intercultural competency aligns with core sustainability competencies (UNESCO, 2017), which are growing in profile as curriculum design principles (QAA & Advance HE, 2021). For example, 'collaborative competency' places an emphasis on learning from and with others and on understanding and respecting their perspectives. Framed as 'Ways of being', the self-awareness and normative competencies stress the importance of reflecting on and acknowledging one's own values and those of others and how all these shape decisions and actions.

Constructs of Sustainable Development have been criticised for their emphasis on western values (Thaman, 2002) thus educational opportunities that bring together students from the Global North and the Global South are valuable in developing trans-national and cross-cultural learning about the UN-SDGs and de-emphasising western-centric values of sustainability. This accords well with strong calls for curriculum decolonisation and rebalancing the Eurocentric perspective of universities (Bhambra et al., 2018; Moghli & Kadiwal, 2021).

In summary, bringing students from different countries together for inter-cultural discussions is valuable. Until recently, such opportunities have been mainly provided through field courses (Phillips & Johns, 2012) and study abroad programmes. However, the rise of virtual student mobility (VSM) offers viable alternatives (Machwaite et al., 2021). VSM is defined as a 'form of mobility that uses information and communication technologies to facilitate cross-border and/or inter-institutional academic, cultural, and experiential exchanges and collaboration which may be credit-bearing or not for credit' (UNESCO-IESALC, 2022). Virtual experiences can open up a wider range of internationalisation opportunities for students than traditional (actual) student mobility, particularly for students who face financial or physical barriers to travel (Schreurs et al., 2006). Virtual mobility also contributes to reducing the carbon footprint of the University sector by providing internationalisation opportunities without international travel (Shields, 2019). VSM has become more widespread as a result of the Covid-19 pandemic and a body of literature is emerging on VSM and its benefits (Machwaite et al., 2021), together with the concept of intercultural virtual collaboration (Ferreira-Lopes et al., 2022). Martens et al., (2010) noted that the use of virtual educational experiences can become an important new method for ESD but empirical analysis of the impacts of such activities which focus on the UN-SDGs are in their infancy (Lenkaitis, 2022).

The virtual mobility experience described here took the form of a three-day sustainability workshop for University students from Ghana and the UK that sought to develop

cross-cultural understanding of the UN-SDGs through the development of the participants' intercultural competency in relation to attitudes, skills, knowledge and comprehension (Deardorff, 2006).

## Materials and methods

### *Workshop design and delivery*

The workshop was developed by colleagues from both Universities and was supported by a grant from the Association of Commonwealth Universities (ACU) aimed at developing virtual mobility. It was designed as an extra-curricular, non-credit bearing experience open to any interested undergraduate student, regardless of their degree subject. Across the three days, students engaged in a range of learner centred, group-based, activities to promote the exchange and understanding of different perspectives related to the UN-SDGs. An emphasis was placed on the importance of cooperation, participation and the development of partnerships in achieving the UN-SDGs, specifically aligning with UN-SDG 17, Partnership for the Goals, which seeks to strengthen implementation of the UN-SDGs and revitalise the global partnership for sustainable development.

Planning for the workshop took place via virtual meetings to develop content, secure digital resources and recruit student participants. The workshop took place in September 2021. Students were invited to apply through general calls. At UoD all students who applied were selected. At UEW over-subscription meant that Heads of Department selected individual participants. Twenty-six students participated, nine from UoD (2 male, 7 female, studying zoology, global development, sociology, geography, marketing, and nursing) and 17 from UEW (6 male, 11 female, studying political science, economics, geography, history and social studies). It was delivered onsite at the two universities. Students in the UK who were unable to travel to campus participated from home and digital bundles (web cam, microphone and enhanced wifi connection) were provided to counter any digital barriers to participation. All UEW students were able to attend on campus and ACU funding enabled enhancement of technical facilities at the Winneba site.

The workshop had three sustainability focused learning outcomes and the research presented in this paper explores the extent to which these were achieved:

- (1) To acquire a cross-cultural understanding of the UN-SDGs.
- (2) To develop the core competencies needed to become a sustainability citizen, with a particular focus on intercultural competency.
- (3) To understand the importance of partnerships in realising the UN-SDGs in local communities and global society.

These learning outcomes and opportunities to enhance participants' digital skills underpinned the development of the key learning materials and activities for the three days (Table 1).

The main activity was conducted in five groups, bringing together students from both institutions and multiple disciplines. Group membership was designated in advance to ensure diverse representation, allowing students to work across subject areas and cultures. The student groups interacted on Day 1, but the main group activity occurred on Day 2. Groups

**Table 1.** Activities conducted during the virtual mobility workshop mapped against learning outcomes.

Activity	LO 1	LO 2	LO 3	Digital skills
Presentations: introduction to sustainability	X	X	X	
Overview of UEW and UoD	X			
Presentation: sustainability in Ghana	X			
Discussion and word cloud: what sustainability means to me	X	X		X
Discussion: developing a sustainability mind set	X	X		
Workshop: communicating with visuals			X	X
Workshop: creating and using infographics			X	X
Group project: creating sustainability infographics	X	X	X	X
Group project: presenting sustainability infographics	X	X	X	X
Planning for future collaborations	X	X	X	

were tasked with designing a poster infographic to raise awareness of an SDG of importance to them, which might also be subsequently utilised as a resource at their universities. Each group presented their posters and considered possible follow-up actions to promote the importance of their chosen SDG within their university communities.

The workshop was configured around Microsoft Teams as the core platform for communication and sharing work. Poll Everywhere ([www.poll.everywhere.com/](http://www.poll.everywhere.com/)) was used for some initial sharing of ideas. The cloud-based design software Canva ([www.canva.com](http://www.canva.com)) was utilised for the infographic creation. In practice, considerable experimentation was needed to find the optimal mode of digital communication. These challenges and their implications are discussed below.

Before the workshop, students were encouraged to review introductory information about the UN-SDGs and to consider which were of most significance to them. These reflections were drawn on to create a full class picture of SDG priorities. Using Poll Everywhere, students logged the three UN-SDGs of greatest personal importance. Results revealed a wide distribution of priorities, with all but SDG 9 (Industry, Innovation and Infrastructure), 11 (Sustainable Cities and Communities) and 17 (Partnerships) being selected at least once. SDG 10 (Reduced inequalities) was the most selected (13% of the students). These wide-ranging interests will have heightened the challenge for each group choosing a single SDG as their focus. In the end, two groups focused on SDG 6 (Clean Water and Sanitation), one explored SDG 14 (Life Below Water), one addressed SDG 1 (No Poverty) and the other focused on SDG 4 (Quality Education).

### *Data collection and analysis*

An exploratory study was designed to review the participants' experience of the workshop and its impact. The focus was on the awareness and understanding of the UN-SDGs, perceptions of skills development, and attitudes towards sustainability. The data collection was questionnaire-based, via pre- and post-workshop surveys. Common components allowed for comparison of pre- and post-workshop views. The pre-survey also sought to understand participants' motivations for engaging with the workshop and their aspirations for it. This survey was distributed to students for completion before the workshop. The post-workshop survey was conducted during workshop time set aside for this to

encourage participation. Ethical review and approval for the study and methods were obtained through UoD and the relevant consent and debriefing forms were shared with students.

Both surveys contained a mix of closed, likert, questions and open questions allowing for free text responses. The closed questions allowed for simple numerical tallying. The qualitative responses varied in length from a few to 173 words. Whilst cognisant of the project's focus on the UN-SDGs and intercultural competency, an inductive approach was taken to the analysis of each open question, following a process of data familiarisation, emergent coding and then the identification of categories (Cousin, 2009). Illustrative quotations from some of the key themes which emerged from the student responses are shared below.

## Results

Twenty-four students completed the pre-workshop survey. Some clear common themes emerged from the responses to these questions. All but three students expressed their hope to strengthen their knowledge and understanding of sustainability issues, with half highlighting the UN-SDGs particularly. The opportunity to engage with, and learn from, others was also a dominant theme of the responses, again noted by 50% of the students, e.g.

I feel sharing knowledge with other students will provide invaluable perspectives and enrich my knowledge and understanding of what solutions can be found for a growing list of related social, environmental, and economical problems (1.16).

Seven of these students highlighted the potential value of working with students from another country, although only one mentioned the value of learning from a different culture directly. The other clear theme in the pre-workshop responses was the extent to which the participants were motivated by their personal interest in sustainability issues and their intention to use their learning in the future. The latter was mentioned in 15 of the responses, e.g.

I hope to be equipped with skills and strategies that I can adopt as an individual to enable me [to] contribute ... in the implementation of the SDGs and it's full realization locally and globally. I also hope to understand how the SDGs affect my own life as a student and my role in ensuring sustainability in my local communities (1.5).

I have always been concerned about sustainable development, so I signed up for this workshop so that I can contribute in my own small way so that this goal of sustainability can be achieved (1.14).

The student participants' commitment to a more sustainable future is also evident in responses to two closed questions in the pre-workshop survey, which queried the extent to which they agreed with the statements: 'I lead a sustainable lifestyle' and 'I encourage others to lead a sustainable lifestyle'. Twenty students 'Strongly agreed' or 'Agreed' with the first statement; the equivalent figure for the second statement was 23.

Overall, there was minimal reference to perceived skills development in responses. A couple of students noted an expectation that engaging with the workshop would enhance their future employability.

## Impact of the workshop

All 26 participants completed the post-workshop survey, which focused on perceived impact in terms of personal learning and development, and the experience of participation. A closed question common to both the pre- and post-workshop survey elicited any changes in understanding around the UN-SDGs. [Table 2](#) highlights a clear positive direction of change.

The lead open question asked: 'What is the most important thing you have gained from the workshop?'. Some students focused on a single item, others shared a range of learning. Twelve students highlighted their enhanced knowledge and understanding of sustainability issues and/or the UN-SDGs. The second most common response, from 10 students, was the insight gained about sustainability issues in a different national context, e.g.

Perspectives from Ghanaian experiences of challenges in SDGs. Insight into cultural, social, environmental and philosophical differences in every day life . . . Great to create international relationships and networks (2.3).

I think the most important aspect has been gaining the Ghanaian perspective on sustainable development, hearing what the Winneba lecturer's and students had to say about sustainability, their own experiences and actually hearing how passionate they are about it has been really insightful (2.23).

Responses to a further closed question recorded that all but two students 'Strongly agreed' with the statement 'I have improved my understanding of sustainability in another country', with the other two noting 'Agree'.

Other key learning highlighted in the qualitative responses was: increased recognition of the importance of the UN-SDGs (five respondents); a sense of greater optimism that a more sustainable future is achievable (four); and a realisation of the importance of cooperation and partnership for delivering the sustainability agenda (four). Skills development featured minimally in the pre-workshop survey but emerged more strongly in the post-workshop reflections, mentioned by nine of the respondents, of which seven highlighted enhanced skills as a result of the group poster exercise, closely aligned to a realisation of the potential of infographics for visual communication. [Table 3](#) shares further insights on skills development as a consequence of the workshop, highlighting significant perceived positive impacts.

**Table 2.** Pre and post-workshop understanding of the UN sustainable development goals.

'I have a good understanding of the UN Sustainable Development Goals'				
	Strongly agree	Agree	Disagree	Strongly disagree
Pre-workshop	38%	54%	8%	0%
Post-workshop	85%	15%	0%	0%

**Table 3.** Perceived skills development as a result of the workshop.

Post-workshop closed questions	Strongly Agree	Agree	Disagree	Strongly disagree
'I have improved my collaborative skills'	92%	8%	0%	0%
'I have improved my communication skills'	96%	4%	0%	0%
'I have improved my digital skills'	73%	27%	0%	0%



Nearly half of the participants highlighted their greater knowledge and understanding of sustainability issues as a key learning point. A further post-workshop open-ended question asked everyone how specifically the workshop had affected their understanding of sustainability. Twenty-three of the students were able to articulate this in some way, sometimes highlighting more than one aspect of learning. Eleven of these students outlined a nuancing of their understanding around one of four themes:

1, The interconnected nature of the sustainability challenge, e.g.

This workshop has enlighten me that each of the goals are inter related and one can't just focus on one aspect of it but focusing on all the others before they can be achieved (2.10).

2, Sustainability does not just narrowly equate to preservation, e.g.

Sustainability is not about just preservation rather it's about how we can use what we have in a way that our unborn generation can also have access to what we are enjoying (2.17).

3, Sustainability is about more than environmental issues, e.g.

This workshop has widened my perspective of sustainability, coming from an environmental background this is what I tend to think of the most when I think about sustainability. But now I know there is a lot more human aspects to sustainability ... (2.18).

4, The challenges that result from weak institutions, e.g.

It has re-affirmed and strengthened my understanding of the institutional flaws within countries that act as a barrier to aspects such as sustainability. Weak institutions has been a common theme that the Ghanaian students would mention throughout the workshop, and although I knew this deep down, this workshop has really given more prominence to that element (2.23).

Furthermore, six students highlighted that the workshop had helped them to become more aware of potential solutions to current sustainability issues; three students commented that the workshop had resulted in a greater awareness of the scale and nature of the problems.

A growing realisation of the importance of collaboration, including at different scales, to ensure a more sustainable future also emerged (five responses), e.g.

It has increased my understanding by making me see sustainability as a global effort and not only national (2.8).

In summary, almost all student participants articulated how their understanding of sustainability had changed because of the workshop, sometimes across several dimensions. A further common question in both surveys asked students to list three words they associated with sustainability. The responses offer less insight on student learning, but nevertheless highlight a range of perspectives about sustainability through a wide range of words chosen: 46 different words pre-workshop ( $n = 24$ ); 50 different words post-workshop ( $n = 26$ ). It's evident that the workshop did not narrow the definition or focus of sustainability for the participants. Across both surveys, 'Environment(al)' is the most commonly used word (12 times), followed by 'Future(s)' (11 times). But a nuancing of understanding is alluded to by some, for example 'Equality/equity' has a higher profile after the workshop compared to before (five times compared to one). Cognisant of the intended outcomes of the workshop, it is perhaps also noteworthy that words which appear only in the post-workshop include 'Collaborative', 'Partnership(s)' and 'Culture'.

## Discussion

The results highlight progress towards each of the outcomes. All students acknowledged a strengthening of their understanding of the UN-SDGs, which seems to have been frequently informed by the cross-cultural interactions. This was epitomised in the content of the co-produced infographics and presentations. Each poster identified key facts, issues and action priorities for both countries and/or university sites that related to the chosen SDG. At their strongest, posters drew on current research and campus-based initiatives from the universities. The post-workshop survey also highlighted the learning resulting from the inter-cultural discussions that took place. Considering responses from all open questions collectively, it is evident that 17 of the 26 participants commented on some aspect of their learning about the UN-SDGs in the context of the other country or at least articulated greater knowledge about that country, e.g.

From my colleagues in the UK, I have learned that we have poor people in the developed world as well. I also learned that due to some actions of the people of UK, there could be water shortage in the future if care is not taken (2.16).

I have learnt that my colleagues in Ghana are very passionate about people and the welfare of people . . . conservation isn't the most important factor, protecting people from the impact of foreign overconsumption (Plastic in sea, lack of assistance) is (2.22).

Whilst the results inevitably highlight an awareness of significant differences between the UK and Ghana, commonalities also emerged, e.g.

How similar educational, social and political challenges can be, as well as how the only difference to both places is in infrastructure (planning/organisation/funding) - I feel that attitude to learning and value of life is completely the same. I did not have preconceptions about this but I was unaware of how rapidly Ghana is developing and how much optimism and knowledge there is regarding SDGs (2.3).

The identification of common ground in cross-cultural partnerships for sustainability is essential.

The enhancement of intercultural competency was a key element of the workshop's second learning outcome. We can infer from the cross-cultural learning outlined so far that the students evidenced, at least to some extent, the attitudes, skills, and knowledge and comprehension of intercultural competency across the workshop leading to the desired external outcome of effective and appropriate communication and behaviour (Deardorff, 2006). The pre-workshop survey highlighted key attitudes which suggested the potential for what might be achieved when the two groups of students were brought together, particularly a curiosity for learning from others in a different country. Subsequently, one student noted that the workshop provided an 'opportunity to share problems with people that are actually concerned' (2.16), highlighting respect and value for other cultures. An attitude of discovery permeates through the qualitative comments in the post-workshop survey, whilst highlighting examples of the listening and observing skills essential to intercultural competency. Some students commented directly on the personal traits of their peers from the other country. For example, one commented on their 'patience, tolerance and collaborative skills' (2.7), another noted that they were 'very friendly and cooperative' (2.15). A further student observed:

This workshop has definitely improved my knowledge on what life is like in other countries across the world in comparison to the UK. As it was a safe space to listen and discuss certain issues concerning sustainable development, the in depth conversations I had have enabled me to reflect on my perspectives and understanding of SDGs (2.19).

The reference to 'safe space' here is encouraging and speaks to the intercultural competency that was evident in this particular group.

The post-workshop survey results highlight well how knowledge and comprehension of sustainability issues and the UN-SDGs changed, and the extent to which this had been informed by access to 'worldviews' emanating from a different continent. It proved less effective at drawing out changes to cultural self-awareness. Also in relation to competencies, an important outcome for some was the development of visual communication skills related to the use of infographics. Striking imagery, well thought-through layout and concise expression, inherent in effective poster design, offers significant potential for effective messaging about the UN-SDGs, both within and between cultures.

The third learning outcome focused on partnership. In the post-workshop survey, nine students referred to a greater recognition of the importance of partnerships for delivering a more sustainable future. The workshop encouraged this awareness through the topics discussed, but also modelled it through the focus on collaborative activities and group work throughout. The challenges of effective digital communication between the two countries were greater than anticipated. Despite the careful planning and bolstering of IT infrastructure at Winneba an internet outage and other technical challenges on Day 1 precipitated swift revisions of approach. The students were central to this problem-solving, for example creating phone-based WhatsApp ([www.whatsapp.com/](http://www.whatsapp.com/)) groups to replace the designated group spaces on MS Teams. As one student noted:

I have learnt that, with hard work, change in behaviour, and determination problems can be solved (2.26).

It is difficult know whether the student is referring to the technical challenges experienced, or this is a broader statement of learning about problem-solving for sustainability. However, inadvertently, the workshop provided good opportunities to execute and model cross-cultural problem-solving.

Overall, the workshop appears to have succeeded in aligning to the key facilitative factors for intercultural collaborative experiences identified by Bird et al. (2020): 'Simple, routine experiences may lack transformative potential because they frequently lack one or more of complexity, affect, intensity, and relevance. By contrast, singular events characterised by multiplicity and multifaceted-ness, intensity, strong emotion, and high relevance possess high transformative potential' (p. 505).

A summary infographic-based check list illustrating the steps required to effectively design and deliver a virtual mobility project was developed for the project funders and is available at their website (Davies-Vollum, 2022). Here we provide recommendations for others looking to develop and evaluate similar experiences.

Given the significance of cultural self-awareness to intercultural competency, a greater emphasis could have been placed on this in the pre-workshop phase to 'surface' students' own views on the characteristics of their national culture and the factors that seem to shape it. Similarly, the survey was less effective at teasing out changes to personal frames of reference as a result of the workshop. Giving the students time to reflect on this as

a follow up to the workshop may have proven beneficial. The recognition of possible cultural differences in expectations about the delivery and framing of virtual mobility may also need to be recognised. For example, the hierarchical nature of Ghanaian education meant that formal introductions were an important part of the introduction to the workshop. This was unexpected by staff from UoD and meant that more time was taken introducing the workshop than anticipated. Such instances can be treated as part of the cross-cultural learning experience when dealt with openly and cooperatively.

As Ferreira-Lopes and Van Rompay-Bartels (2020) note, the development of virtual mobility opportunities requires substantial efforts from and effective collaboration between partnering universities. This development is not limited to academic aspects of the virtual mobility experience but should also include an understanding of the technical facilities required for delivery of such projects. This is particularly important when one of the partners has more limited technical facilities. In our case, despite having additional bandwidth secured as part of the project funding, internet accessibility challenges emerged. Having a 'try out' using the specific room set up and connections would have helped us to address some of these challenges. Although the technical problems were a source of frustration, they created unintentional learning opportunities and provided an authentic example of the reality of digital poverty in Ghana. As some of the Ghanaian students acknowledged, poverty encourages an adaptable and flexible mindset. Sometimes, in delivering virtual mobility activities, unintentional opportunities may be as important as those that are planned for with benefits gained from collaboration, cooperation and problem solving. It would, therefore, seem wise to ensure flexibility is built into schedules, and treat technical problems as part of the learning process. Finally, the time zones in which the partnering institutions are located needs to be considered. Any time difference needs to be planned for and could necessitate greater use of asynchronous activities to support synchronous collaboration scheduled at times convenient for both locations.

This was an exploratory pilot study to uncover the effects of a cross-cultural virtual experience on students from two different countries and can be used as model for others to follow. The before and after surveys used to draw out the impacts allowed for valuable comparison of quantitative and qualitative responses. The surveys revealed changes to student understanding, awareness and perspectives of the UN-SDGs. Key elements of Dearsdorff's model of intercultural competency are evident in the responses too, although the method was less effective at drawing out changes to cultural self-awareness and personal frames of reference. These aspects may require longer-term reflection and data collection rather than immediate end-of-workshop responses. Post-workshop interviews with some of the students would have been a useful, focusing on the 'journey' each student travelled over the workshop, how the perceived safe space was created, and key learning moments. An alternative would have been inclusion of strategic reflection during the workshop. In addition, a nuancing of the data collection method would have allowed specific comparison of each individual's responses before and after the workshop and contributed further to our understanding of the student journey. We were unable to tease out any national differences between the experiences and perspectives of the UK and Ghanaian students as survey responses were not separated by country. A final reflection is that students who registered for the workshop were self-selecting with many already expressing an interest in and knowledge of the UN-SDGs prior to the workshop (Table 2).

Deardorff (2015) observes that developing intercultural competency is a lifelong, developmental process, so there is inevitably a limit to what can be achieved in a three-day workshop. It is, therefore, positive to note that the influence of this virtual activity has continued. As a result of the workshop, UEW students have been inspired to set up their own sustainability club, inviting Derby students to join them. The workshop has also provided a gateway to physical mobility. Travel to UEW now forms part of UoD's Turing Scheme offer and UoD students from the workshop were participants in the first Turing programme to UEW in July 2022.

## Conclusion

This paper has highlighted the potential of virtual mobility to enhance cross-cultural understanding of the UN-SDGs and facilitate the development of intercultural competencies. These intended outcomes were delivered through the planned activities, which had a strong focus on group working, but also through unplanned learning, which emerged through the problem-solving of technical challenges encountered. The authors agree that the virtual workshop was a journey into the 'pedagogic borderlands' as defined by Hill et al. (2019): liminal spaces, lying somewhere between the familiar, comfortable and certain compared to the new, unsettling, and unpredictable. But it is in these spaces that the potential for more transformative intercultural experiences exists.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Funding

The research was undertaken with support from a Virtual Mobility Project. Grant from the Association of Commonwealth Universities.

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