



**GAIA**  
Geoscience Access,  
Inclusion & Attainment

*University of*  
**HUDDERSFIELD**  
Inspiring global professionals

# Making geoscience degrees **a place of belonging for all**



Natural  
Environment  
Research Council

**CHANGEMAKERS UNLTD**  
CONNECT, COLLABORATE, CREATE

# Making geoscience degrees a place of belonging for all

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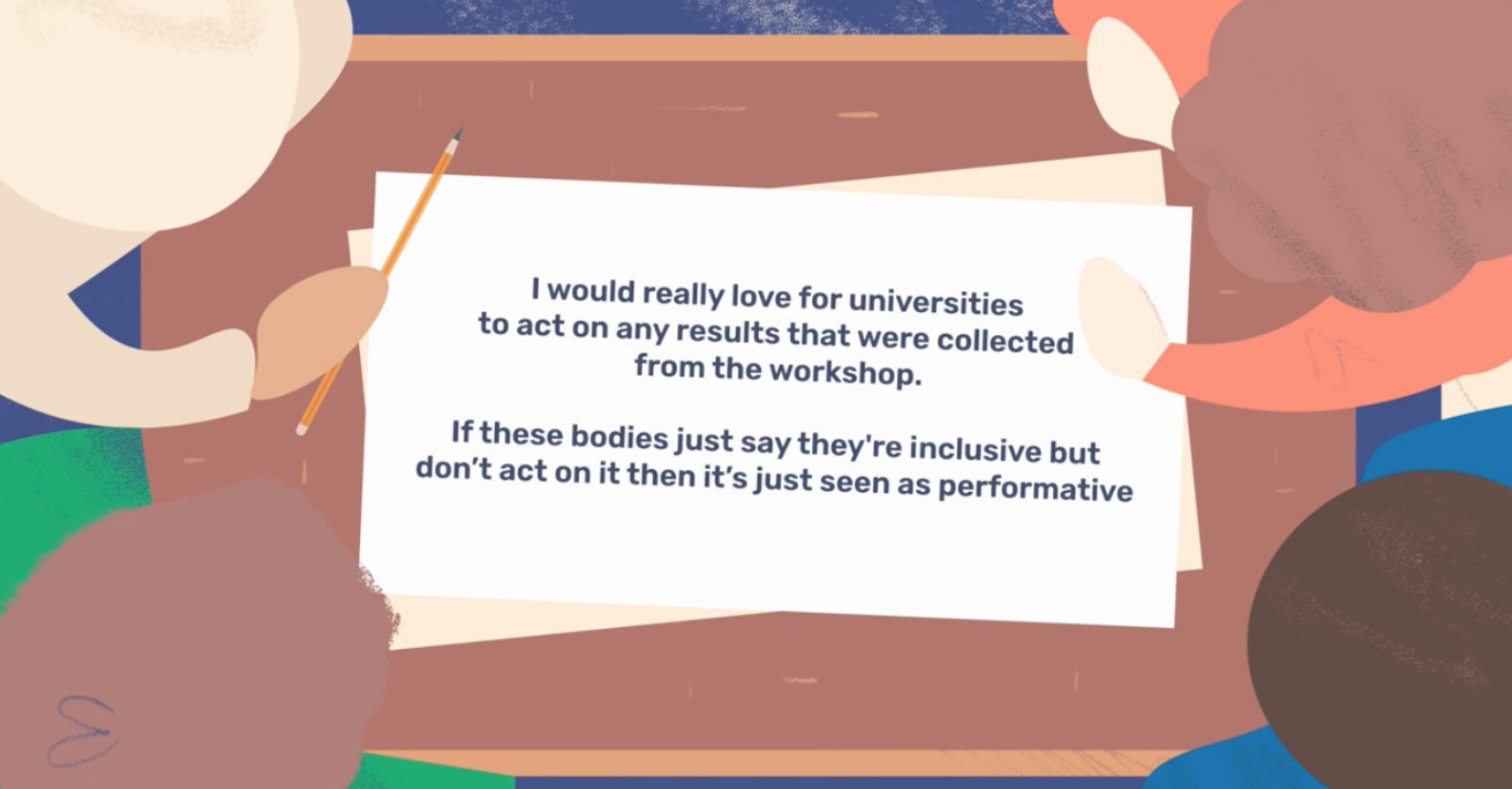
## Background

Geoscience is a key discipline for addressing many of the challenges that face us today, including climate change, sustainable resource management, environmental remediation, sustainable agriculture, and natural hazards (Gill & Bullough 2017). However, there are many groups that are underrepresented in geosciences at all levels, from school through to senior professionals (Dowey et al. 2021).

For example, Higher Education Statistics Agency statistics indicate that, while students from Black and Asian backgrounds are overrepresented in science undergraduate degrees compared to the population of 18–24 year-olds as a whole, they are heavily underrepresented in geoscience and physical geography degrees (HESA 2022). A recent (though non-comprehensive) survey of membership by the Society for Sedimentary Geology shows a similar pattern of underrepresentation of multiple groups at the postgraduate and professional level (Harper 2022).

Geoscience degrees can lead to rewarding, well-paid and influential careers that make a real difference to our societies and environments. Working to improve the diversity of geoscience at all levels will help both to increase justice and equity, and to enhance the discipline as a whole. It has also been shown that the inclusion of diverse perspectives leads to more innovative and creative thinking (Jones 2005). In order to find equitable and socially just solutions to some of the biggest environmental challenges of our time, geoscience degrees must embrace diversity and centre justice.





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## **The GAIA project**

The Geoscience Access, Inclusion and Attainment (GAIA) project, led by researchers from the University of Huddersfield, ran from December 2021-June 2022 and was funded by the Natural Environment Research Council. The goal of the project was to trial methods of increasing the representation of groups that are currently underrepresented in geoscience undergraduate degrees.

These groups were specifically: students from Black, Asian and minoritised ethnic and/or religious backgrounds; LGBTQIA+ students; students with disabilities; students from low-income backgrounds; first in family to go to university; students from non-traditional educational backgrounds; students with a caring responsibility; and international students.

A further integral aim of the project was to understand how the experiences of undergraduate students from underrepresented groups in the

geosciences could be enhanced and their views amplified. We ran three workshops for current or recent undergraduates in any geoscience discipline who identified as being from underrepresented groups. During these workshops we asked participants to discuss their experiences during their degree programmes and to suggest ways in which geoscience undergraduate degrees could become more welcoming places for a more diverse community. The results of those workshops are detailed in this report.

## Participant profile

A total of 34 participants attended the workshops, along with two co-facilitators who were also current or recent geoscience undergraduates from underrepresented groups.

18 universities were represented, including Oxbridge, Russell Group, non-RG pre-92, and post-92 institutions. The majority of participants attending these workshops attended universities in Northern England, though participants themselves came from all over the UK and beyond. No participants who attended the workshops were undergraduates from universities in Northern Ireland. Degree programmes represented included physical and

human geography, geology, geochemistry and environmental science. Table 1 presents aggregate statistics of the groups the participants identified themselves as belonging to. Most participants identified themselves as belonging to more than one group.

Group	Number of participants
Black, Asian or minoritised ethnicity/religion	29
From low-income household	17
LGBTQIA+	13
People with disabilities	13
First in family to attend university	15
Non-traditional educational background and international students	4
Caring responsibility	0

Table 1: Group identifications of GAIA workshop participants (excluding co-facilitators)



## The undergraduate experience

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Participant responses to questions about their undergraduate experience fell into several themes:

1

### My family/friends back home don't understand why I would want to do this

Participants repeatedly stated that their families and/or communities had little understanding about the content, skills or job prospects of geoscience undergraduate degrees. This perception of geoscience degrees as lacking in value was particularly discussed by students from minoritised ethnicity and/or low-income backgrounds.

“I had a lot of questions of ‘why are you choosing geography, what can you do with geography?’”

“What you get taught at university is very different from what people think it is. In the media you know what physicists do because you’ve got Brian Cox, you’ve got David Attenborough, people can see value in that. For geography everyone doesn’t really know what it is and they’re like ‘what can you get out of that?’”

“No-one really knew what I could do with that [a degree in geosciences] and they were like ‘oh, I don’t think you should be doing that.’”

“I am and will be supporting my family, it was considered a risk... If I became a lawyer I’d probably be able to earn a lot more.”

“I don’t even like telling people that I do geography because they just start [saying] why would you choose that, you can’t get anywhere with geography... you can’t really get jobs with that.”

“I did geology, so my family were happy I was doing science, but they didn’t know what geology is!”





## 2

### I don't see myself reflected in the discipline

Participants noted the whiteness and lack of diversity in both teaching staff and guest lecturers as well as in some of the careers and companies employing geoscience graduates. This led to a sense of alienation for the participants and a sense that staff sometimes lacked understanding of or sensitivity to the problems specific to particular underrepresented groups. However, many participants also commented on how individual staff were welcoming and inclusive. One aspect that was mentioned by multiple participants was a lack of case studies and examples from outside the UK/the West in lectures and assignments.

“I wanted a placement but honestly, everybody in that company was 97% male and they were white... I don't really want to work for a company like that, you know, I'd feel so left out. Sometimes I feel like I don't really know what I'm going to do after university because it feels really lonely sometimes.”

“Geography is a very good subject, I love it so much because we learn so many things, but I think it's just such a shame that we have such low diversity... You feel really lonely and you can't relate.”

“Queerness is still seen as other and alien even in specific queer geography lectures. It's not encouraging at all.”

“I love geography, always have done, always will. I've never not felt a geographer. But I've always felt other because of being non-white.”

“Some examples [in lectures] were very limited to the Western world and whenever I wanted to talk about examples from my country I used to be shut down by the lecturer saying 'oh, that's not what we cover'. And when I chose ... to write about my country in that module, I got very harsh feedback that I should have chosen from what was taught, even though in the brief it says you can choose any country.”

“We do feminist geographies, colonialism... I do like it but... I just find it really ironic how I've never been taught by a Black geographer, Asian... even the feminist geographies I get taught by a man.”



“It’s important because that lack of representation carries on outside uni as well. The people who are in control of tackling environmental problems don’t represent where a lot of the environmental problems are taking place. I think it’s really important to have that representation and input from underrepresented groups.”



### 3

### It’s hard to overcome the structural barriers

Participants identified a number of structural barriers leading to increased hardship for geoscience undergraduates from underrepresented groups. These included: difficulties in getting appropriate accommodations for disabilities; the cost of field trips and field equipment; field trips to locations that were unwelcoming to members of particular groups; lack of accessible field trip alternatives; the assumption that geoscience undergraduates would be experienced in outdoor activities.

“I have a few disabilities and... you have to pay to get assessed and a lot of the time they don’t accept prior assessments... I know a lot of my friends have decided not to pay because... ‘I only get a bit of extra time, I’d rather keep the money.’”

“You have to really email and email and email [to get your disability accommodations] so I can see why a lot of people just give up.”

“[Disability services] just want to chuck a laptop at me... I just want help, some kind of guidance or support, that was not offered. I feel like they’re just ticking a box, ‘oh, we helped, we threw a laptop at her.’”

“When it came to inclusion, I felt there were some structural barriers towards me as someone from a low-income family to do with the course itself in terms of funding, and you’re expected to go on field trips and things like that which costs money, which I didn’t have. So for me it was more of an emotional attachment to the course rather than feeling like it was structured around my inclusion.”



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“Most of the feedback was that I’m not a member of any of the societies, which I would love to join, but I just don’t have money, being from this working-class background... I didn’t have enough... fieldwork experience but... most of the fieldwork you have to pay for and again as someone from the working class I can’t afford that.”

“I was told that because I didn’t have a first in my undergrad I probably would never get into a PhD even though I have a distinction in my master’s. I was told that I shouldn’t even try applying for PhDs.”

“I didn’t have walking boots and waterproof trousers and everything and in my department it was almost like ‘well, why don’t you if you’re doing geography?’ There was an expectation that you should have that stuff.”

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## 4

### I don't see myself reflected in the student body

A number of participants reported a culture on their courses that left them feeling alienated in relation to their peers, with lack of opportunities for meeting and socialising with other members of underrepresented groups. This was reported by participants across all our underrepresented groups. This situation was exacerbated by the COVID lockdown which affected most of our participants at some point. Students discussed, and made notes (see Figure 1), about the dominance of some exclusionary practices within the geosciences (e.g going to the pub after fieldwork) and racist, ableist or homophobic microaggressions that affected their sense of belonging.

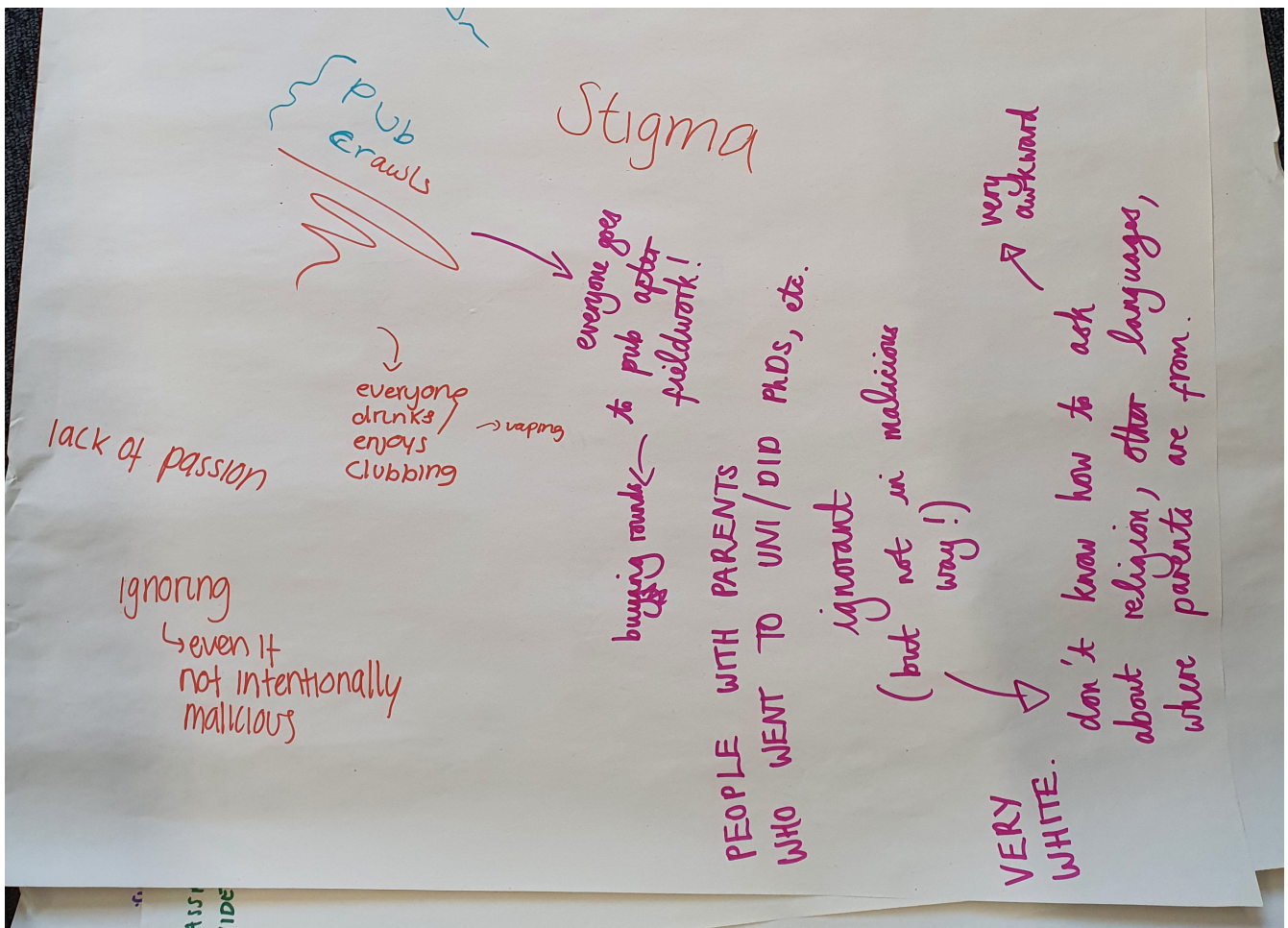


Figure 1: Examples of exclusionary practices within geosciences



“It’s just this kind of air – it’s not necessarily spoken [about] at all, it’s not like I’ve had to endure any kind of awful behaviour or something but it’s this kind of feeling that if you try and push forward and make conversation and try and interact [with some other students] you just end up being left out and put to the side. It’s obvious when you look at who’s being left out why you’re being left out.”

“From peers, yes – I didn’t feel like I belonged at all... I had my group of friends but from some other groups I experienced quite a lot of microaggressions and in my second year I had to change and adapt and I just pretended that I don’t speak another language and tried to integrate myself into being what they thought I should be. ... ‘If you’re not like us we’re not going to talk to you.’”

“I did feel like the students made me feel different. No-one would approach you in class, everyone was in their own little groups and once they’d made friends they didn’t want to try with anyone else.”

“I enjoyed my course and I had a good friendship group... I was the only queer person in the year so there weren’t any contemporaries I could look to to discuss those issues.”

“As a queer [male] person having the life experiences that you do, I was always really really anxious about groupwork... about getting put in a group with all boys... especially on residential field trips.”

“It’s very easy for a university to say that they are inclusive and tick all the boxes of having different people from different backgrounds, different demographics and stuff like that all in the... statistics. But I think as much as they can do that, they don’t always put things in place to make you feel like you belong... When it comes to stats, it doesn’t look at the context that it’s been put in, so yeah, you might say a quarter of the course is from minority groups, but where’s the context behind that? Where have they come from, what is the reason they picked that course, how do they feel about that course? Have they got onto that course through clearing or did they choose to be on it?”



## Recommendations: creating a place of belonging for all

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The workshop participants made a wide range of suggestions for how to make geoscience undergraduate degrees a place of belonging for all. We have grouped these into a number of themes. Some of these are easier to implement than others, but many of them can be implemented both by individual lecturers and by programmes as a whole.

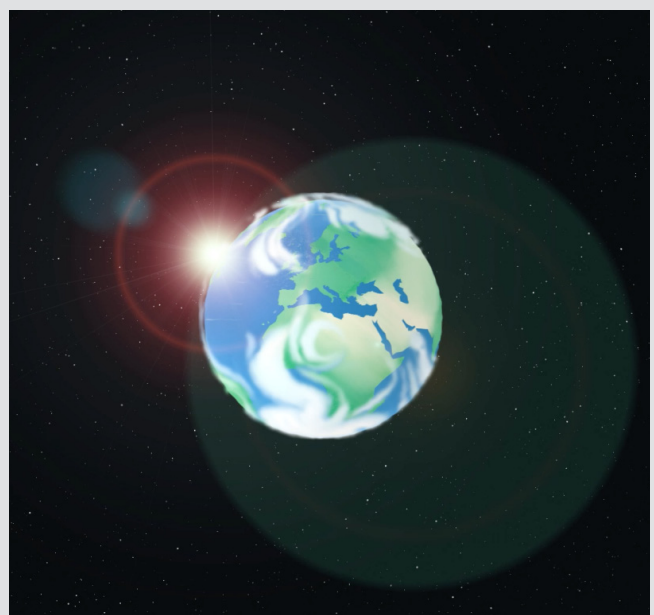
### 1. The reputation of geoscience

**Problem:** lack of understanding of geoscience as a discipline on the part of family, friends and community.

#### Recommendations:

- A programme of outreach to underrepresented communities, preferably working with ambassadors from those communities (both undergraduates and graduates) who are fully remunerated for their work
- Encourage current students to talk to their family and friends about the subject
- Provide detailed information about possible career paths at university open days and during outreach with schools and colleges; provide schools and colleges with information about the concrete career options available with a geoscience degree.

“When it comes to outside of university and talking about the course and everything with friends and family, they always say ‘geography? look, what are you going to do with geography?’ Now I don’t feel ashamed about saying that I do geography because I like explaining it to them. I’ll explain how diverse the topics are and everything. Then they click and say ‘oh yeah, that does sound really interesting.’”



## 2. Lack of knowledge of the application process

**Problem:** students from underrepresented groups may not be able to attend open days and may not have the knowledge to navigate the applications process.

### Recommendations:

- Provide alternative virtual open days and tours
- Provide information about the application process at open days and on course websites
- Have visible student role models from underrepresented groups be part of widening participation programmes and open days
- More information about alternative routes rather than just Russell Group or Oxbridge (other universities, apprenticeships etc.)
- For international students, step-by-step guidance on visa applications.

## 3. Financial/resource equity

**Problem:** extra costs involved in field trips and associated outdoor clothing and equipment.

### Recommendations:

- Free fieldtrips or bursaries to cover fieldtrip costs for low-income students
- Provide or lend outdoor clothing to those who do not have it
- Bursaries to cover cost of getting a passport for those who do not have one
- Be clear up-front about extra costs associated with a course or with specific modules – make this clear on course website, in prospectus etc. with plenty of notice to allow students to budget and save
- Ensure that group work takes place on campus rather than, for example, in a pub or restaurant which some students may not be able to afford, or may not feel comfortable visiting.

## 4. Accessibility of field trips

**Problem:** field trips may be inaccessible or daunting to students, for example those with disabilities, those who are not used to being away from home, those with caring responsibilities, or field trips to places or areas where queer and/or minoritised ethnicity students may face discrimination.

### Recommendations:

- Consider fieldtrip locations from the point of view of specific student groups
  - Provide detailed information about arrangements and dates well in advance of the trip
  - Allow for room/group assignments to be changed with clear justification and make this explicit rather than waiting for students to ask
  - Provide alternative field trips (or virtual field trips) for students that cannot access particular trips
  - Be clear and transparent about any accessibility issues and proactively approach students who may find themselves excluded to discuss solutions
  - Explicitly factor in toilet breaks and supply information about the timings for these in advance
- Consider all field trip venues (including social venues) in terms of accessibility. Offer spaces and opportunities for socialising on fieldtrips that do not automatically involve alcohol.

“My uni was really good because before any field trip they’d send a Microsoft forms round with key points and questions you might want to ask and they touched on absolutely everything... I’ve got really quite bad anxiety and it helped a lot... I am quite thankful. That might have helped a lot of other people.”

“As a queer [male] person having the life experiences that you do, I was always really really anxious about groupwork... about getting put in a group with all boys... especially on residential field trips... put people in allocated groups, but if there is a problem and someone really doesn’t feel comfortable, perhaps there should be an option for you to speak to someone and say is it all right if I move rooms?”

## 5. Including more voices

**Problem:** students from underrepresented groups do not see themselves reflected in teaching staff or guest lecturers.

### Recommendations:

- Actively seek out geoscience professionals from underrepresented groups to give guest lectures
- Provide opportunities for members of underrepresented groups, including present and past students, to be part of the planning and feedback process for courses and modules
- Have an EDI panel/forum with student membership in each department
- Offer a BAME mentoring scheme to students throughout their studies, but particularly in their first year.

“Even if it was just one session every couple of months, and it wouldn’t even have to be a lecturer... someone [from an underrepresented group] coming in to speak for half an hour, I think that could make so much difference. You don’t always have to learn and gain knowledge from lecturers.”

## 6. More global perspectives

**Problem:** examples and case studies tend to be drawn from UK, resulting in a narrow range of perspectives and possible solutions to environmental problems.

### Recommendations:

- Seek out case studies from around the world, particularly showcasing different approaches to geoscience issues
- Be explicit about how environmental and geoscience issues affect different groups differently
- Tailor examples to student body to foster belonging. This can be effective even if it is just the brief mention of a place with which a given student has an affinity
- Allow students to choose assignment case studies from outside the UK
- Integrate discussions of equity and justice, the colonial histories of the geosciences, and opportunities to decolonise the geosciences into the degree programme early on (rather than an optional module in the final year).

“One of my lecturers, I had just like a little private talk with them and I told them where I was from and then the next day in one of the lecture presentations he included a visual aid... he used a city of where I’m from... that was really nice.”

“When they show innovation or sustainability it’s always very UK- and England-based – it’s great to learn what the UK’s doing... but I would really be interested to know what other countries with a different context are doing and open the perspective a bit towards for example how other countries are approaching climate change. When you graduate with that one perspective it limits you to just work in this country or to think of solutions according to what’s being done in this country.”

## 7. Fostering belonging

**Problem:** students from underrepresented groups may experience alienation from peers and feel isolated.

### Recommendations:

- Provide or signpost opportunities for socialising outside lectures, especially events that do not involve alcohol
- Practical and compulsory education/training for both staff and students on equity and justice and the barriers that exist, not just limited to optional academic modules
- Compulsory early module concerning decolonisation
- Mentoring programmes for first-year students with mentor matching based on protected characteristics

- Encourage mixing of groups in seminars and field trips from day one
- Make an effort to pronounce people’s names correctly. Use of #MyNames tools and inclusion in email signatures <https://mynameis.raceequalitymatters.com/>
- Acknowledge and make accommodations for cultural/religious events such as Eid
- Consider cultural/religious events when planning assignment deadlines
- Staff to be aware of the need to pray and proactively inform students about prayer facilities
- Acknowledge explicitly that higher education can be lonely and difficult
- Overall, a call for more flexibility, guidance, and support.

“Develop a culture of asking. It’s not a negative thing to ask about somebody. I know that if somebody asks me about my background or my culture [or how to pronounce my name], I’m happy to speak about it, rather than them making assumptions about me.”




## 8. Networks and opportunities

**Problem:** students from underrepresented groups often lack networks and are unaware of internship opportunities that may be available to them for networking, internships, scholarships, volunteering etc.

### Recommendations:

- Signpost opportunities, including opportunities targeted at specific groups, during induction and repeat announcements at several points throughout course
- Have a central repository where students can find information about targeted opportunities and networks
- Collaborate with more diverse departments in the university to have a larger diversity of student ambassadors at open days and induction weeks who can give students from underrepresented groups more general information about what it is like to study at university
- Direct students to larger university and extra-university support networks that may not be specific to geoscience.

“There are quite a few opportunities but it’s a shame that they don’t get shared... the work that groups like Mosaic do only gets brought up when it’s “relevant” to the course, but it’s always relevant. [Mosaic Outdoors aims to ‘build sustainable links between Black and Minority Ethnic communities and the countryside and outdoors.’]”



What can we do to make things better?

## 9. Careers advice

**Problem:** students from under-represented groups often lack experience in how to pursue particular careers or don't know what careers geoscience degrees can lead to.

### Recommendations:

- Tailored, practical advice on interview practices and dominant organisational cultures and expectations
  - Transparency on how accessible careers and specific companies are for underrepresented groups – for example, whether a company has a good mental health policy
  - Actively seek out industry professionals from underrepresented groups to be involved in careers sessions and placement support
  - More guidance on the types of careers available, given the breadth of directions which geoscience degrees permit – university careers services may not have as much knowledge as geoscience teaching staff or vice versa
- Many graduate programmes use fairly generic automated testing systems as a first round qualifier – provide practice with these
  - Advice on the employment rights of people with protected characteristics and links to groups and resources that can provide support.

## 10. Collaborative action

Many of our participants emphasised the need for collaborative action across schools, departments and universities and between universities and geoscience employers in order to address the issues raised here. This may help address the difficulties of finding appropriate mentors and speakers within one's own department/institution.

## Conclusions

Equity is not just a question of inclusion, but of belonging. Yuval-Davis (2006) differentiates between a sense of belonging (concerned with emotional attachment, feeling “at home”, feeling safe) and the politics of belonging, which focuses not only on who is included or excluded but what constitutes the requisites of belonging (and the contestations around this) – who has the right to be recognised as included, and why. While we need to recruit more students from underrepresented groups into undergraduate geoscience degrees, we also need to ensure that students from these groups feel welcome, safe and valued when they arrive, and that institutions and departments facilitate students’ sense of belonging and just treatment throughout their student experience. As one student put it (see Figure 2), students from underrepresented groups themselves should not need to do the exhausting work of bringing about justice and inclusion.

These recommendations are not comprehensive and cannot address many of the structural forces that underly inequities, but they are designed to be concrete steps that geoscience educators and the institutions they work for can take to begin to make geoscience a place of belonging for all.

**For further reading and links to useful groups to signpost to students, visit [geoaccess.org.uk](http://geoaccess.org.uk)**

“It’s important for universities to put things in place after they’ve included people to make sure and encourage them to feel like they belong and are accepted.”

“I would really love for universities to act on any results that were collected from the workshop. If these bodies just say they’re inclusive but don’t act on it then it’s just seen as performative.”

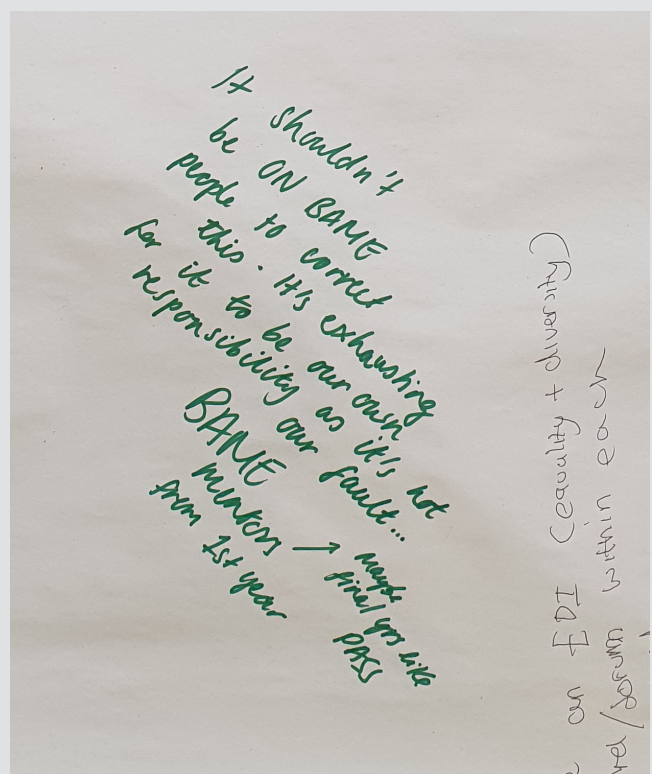


Figure 2: Participant comment from workshop.

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