



DIVERSITY^{IN} HPC

Improving Accessibility to HPC training

Authors: Toni Collis, EPCC and Clair Barrass, EPCC
Foreword by: Alan Simpson, EPCC

BEST PRACTICE GUIDE



Contents



About the HPC Diversity Project

The HPC Diversity project aims to improve the representation of under-represented groups working in the high performance computing and supercomputing community, encouraging participation by all, and showcasing that HPC is a career path available to everyone.

HPC Diversity is a project based in the UK, developed by EPCC and funded through the UK national supercomputing facility ARCHER and the EPSRC research grant EP/N006321/1.

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Foreword

Diversity is a critical issue in HPC as no personal characteristic should be a barrier to participating in HPC, or indeed any other sphere of society.

You may ask what real interest does a fifty-year-old white man have in diversity. But scratch the surface and you find a Northern Irish man who grew up during the religious “Troubles” in Belfast, and who has a gay daughter, and a son with specific learning disabilities. In reality, many people are in some minority, and so the overwhelming majority of people have experienced the misery of prejudice in one form or another, or seen this happen to a close friend or relative. So, diversity is an issue that we all need to address to ensure a successful, caring society for the future.

HPC is a vitally important field that greatly benefits our society, through understanding climate change, better medical treatments, quieter planes, improved energy efficiency, etc. To maximise these benefits, we need to continue to attract the most talented and enthusiastic individuals, irrespective of their irrelevant personal characteristics that make no difference to their ability to deliver valuable contributions.

Research and HPC have often been at the forefront of societal change; maximising diversity in HPC is an opportunity to benefit the field and to benefit society at large. As training is a key component in opening doors to new groups this guide aims to share the steps we have taken that we have found are useful in reaching out to new individuals and new communities.

The HPC Diversity project, funded through the Engineering and Physical Sciences Research Council project ARCHER Outreach (EP/N006321/1), aims to provide resources to help engage new users and communities, teach us all how we should be opening doors through simple changes in the way we teach or train, as well as highlighting the already diverse community to those who may be considering joining this exciting field.

Alan Simpson
ARCHER Outreach Principle Investigator
Technical Director, EPCC, University of Edinburgh

Introduction

This guide covers best practise on encouraging participation, from registration through to enabling delegates to participate in a meaningful way during an event, as well as accommodating individual requirements and disabilities.

This guide aims to share the best practise developed by EPCC and the UK National HPC facility, ARCHER, training programme, built up over many years of training academics, researchers and university students the tools and techniques of High Performance Programming. This guide is not meant to be a resource that covers everything, nor can we guarantee that everything we say is the best way of doing things, but we hope that by sharing our experiences that others can benefit.

Above all, we would encourage you to pause and think about how you currently run training and continually question if anything should be done differently.



The importance of broadening participation in training

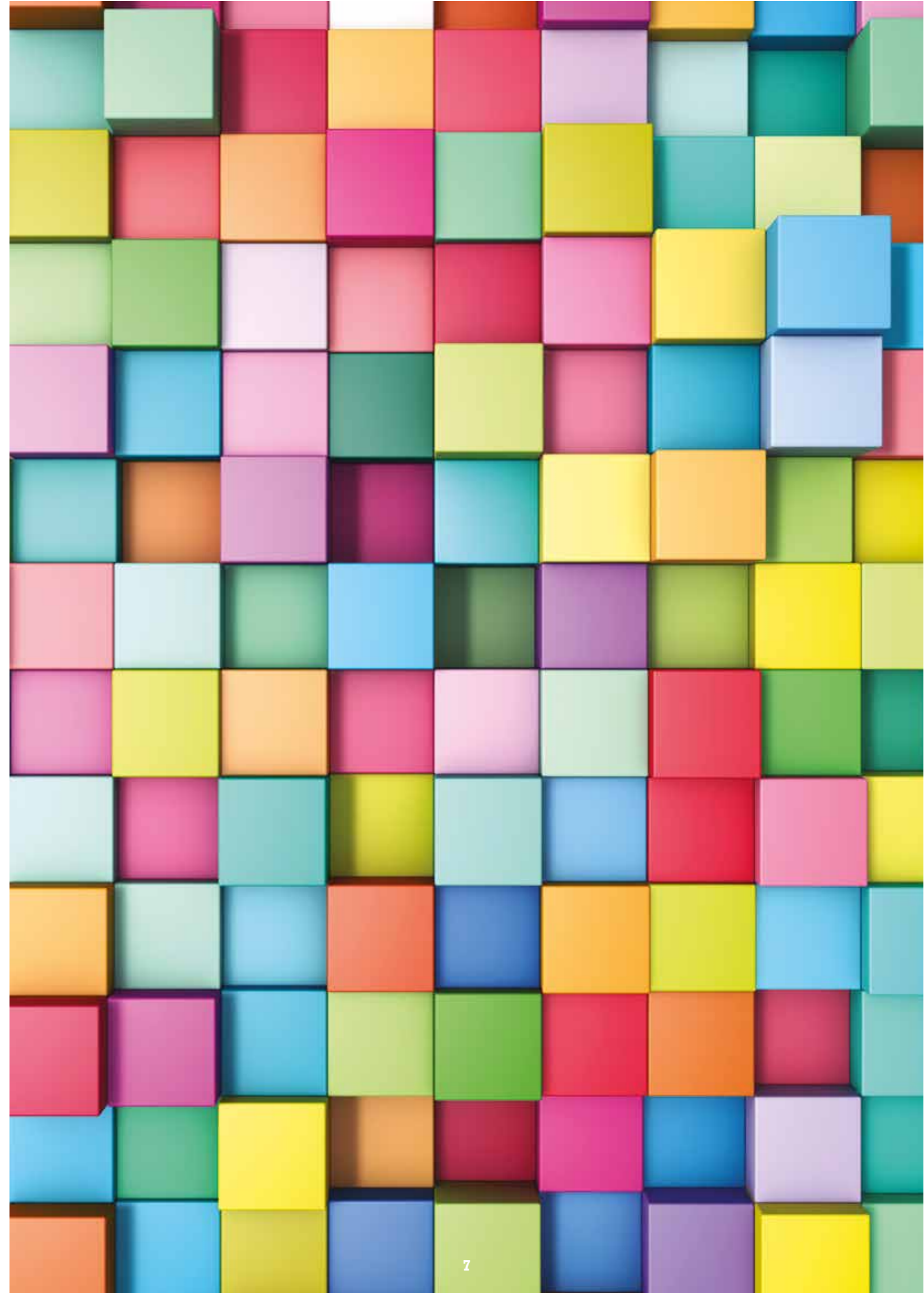
Training is a key component to every part of career development, education and maintaining up to date knowledge in a chosen career path. Good quality training can also open up new career opportunities, enhance personal experiences, improve research output, and enable employers to gain the best from their employees. However, poor training, particularly training that is seen as exclusionary or restrictive can have a negative impact greater than any potential for positive outcomes.

It is important to ensure training is available to everyone. The UK Equality Act 2010 requires that accessibility to activities such as training is not influenced by an individual's personal characteristics or 'protected characteristics'. Ensuring the ability to participate is not subject to the person's personal characteristics however is not sufficient: we need to ensure that all feel comfortable and confident to participate. We need to appreciate that our behaviour as training providers, leaders and institutions can influence a person's willingness to participate, their attainment and performance when they do participate and their likelihood of seeking out further training or using the knowledge imparted to them during any event.

The material in this guide aims to help you remove any barriers in training, many of which, as trainers, we may not be aware of. This will help to ensure that all feel able to participate, everyone gains as much as they can from a session or material, and will enhance the experience of participants. We hope that by sharing this information we encourage more to take part in HPC, broadening the diversity of the HPC community, providing positive impacts both socially and economically.

This guide aims to share the experiences we have had during the ARCHER training programme. We welcome input from others on how to improve training further.

If you would like to provide feedback please contact info@hpc-diversity.ac.uk.



Improving participation during advertising and the registration procedure

One of the most important steps in broadening participation in training is how we advertise events and gather registrations.

It is important to:

- **Consider where you are advertising the event and to who**

Do you always advertise to the same groups of people? Consider reaching out to new communities, particularly those that you may never have worked with before, but may still learn useful information from your course. This is of particular importance for entry-level training, but should be considered even for advanced courses as there may be a community that is not being reached that could still benefit from your training, but may require reaching out beyond your normal communication channels.

- **The language and images used in advertising the event**

The choice of language is crucial in encouraging participation. Be aware that minority groups are more likely to consider that a course is beyond their current abilities, so tailoring the language that describes the course to ensure it minimises the use of jargon, and instead focuses on concepts is crucial to engaging minority groups. Images should show a diverse range of participants, helping potential participants to identify with those that have previously attended the course.

- **Gathering sensitive information about the participants**

It is useful to gather information on the participants, either for your own records to monitor the proportion of particular groups attending, such as the percentage of male and female trainees, but also to facilitate the trainers and provide catering information. However, gathering this information too early in the registration process can reduce the likelihood that a participant will complete the registration form and also whether they will attend the training. Ideally gathering any information with regards to gender, ethnicity, disabilities etc. should be decoupled from the registration process. Gathering this information too early may result in the individual responding to 'stereotype threat' where they are reminded of their minority affiliation, real or perceived, and therefore are less likely to continue with registration.

- **Encourage ongoing engagement**

Many of us are more likely to attend an event if we feel we have some reason to engage. If your training is free to attend this can be a particular problem as registrants may not turn up, taking up valuable places for others. To encourage continuing participation and for the trainees to attend the event it is essential to establish a dialogue with attendees before the event. Engage the registrants in emails, ask them to prepare for the workshop and provide help through email if necessary and ensure they are given access to a timetable before the day.

Best practice:

1. Minimise the use of jargon in advertising.
2. Reach out to new communities to encourage participation.
3. Ensure any images of people are representative of society.
4. The registration process should ask for personal characteristic information at the end of the form and ensure that the registrant knows that this information will not be used in determining the individual's registration status.
5. Do not ask for sensitive information such as disabilities, dietary requirements etc. in the registration process, instead request this at a separate stage once the participant's registration is confirmed.



Accommodating disabilities procedure

What do we mean by “Disability”?

The definition of a ‘disability’ means different things in different countries, and there are often differing legal definitions. The term can encompass many different things, but in general, in the UK a disability can refer to:

- Physical disability, for example someone with limited mobility or requiring the use of a wheelchair.
- Specific Learning Difficulties, for example Dyslexia
- Autistic Spectrum Disorders
- Visual Impairment
- Hearing Impairment
- The need to Assistive Technologies

Mobility Impairments

Mobility impairments may present as a wide variety of disabilities. They may include someone who uses crutches, braces, a wheelchair or does not have any obvious physical aids but is less mobile than is generally anticipated.

Be aware that participants with mobility restrictions will not just need special requirements in order to attend training, but the catering and bathroom facilities available also need to be considered.

Many free training events do not provide catering to help minimise costs. However, it is important to consider all aspects of the day in relation to mobility impaired participants. A participant with mobility impairments may not be able to take the ‘5 minute walk’ to the nearest food outlet, or may be significantly delayed in getting back to the course.

Be aware that:

- Participants may wish to record lectures.
- A wheelchair is part of a students ‘personal space’ – do not lean, touch it or push unless asked. When talking one-to-one with someone in a wheelchair, always be seated so they do not have to peer upwards at you.
- Understand that delegates may be late, and do not expect them to explain why: you may not be aware of their mobility or other disabilities.
- Be prepared to make special seating arrangements as required, particularly in lecture theatres with fixed seating which may be inappropriate and inflexible.
- Not all impairments are constant or unchanging, exacerbations/relapses or hospitalisation may occur.

Case study: a last minute venue change

A course was being held in collaboration with another event, with the venue management being organised by the collaborating partner and taking place in a hotel. The trainers checked that the room assigned for the training was fully wheelchair accessible, which it was at the time the session was planned.

A course delegate contacted the hotel, giving the room details as provided on the course registration page, to check if the room was wheelchair accessible, which it was.

A few days before the training took place the room was swapped with another event taking part as part of the same programme. The trainers informed participants but did not check that the new venue was wheelchair accessible, which it turned out not to be. On the day the trainers found out that the delegate was unable to use the stairs by themselves. In addition coffee, lunches and toilet facilities were all on a different floor from the training room.

Lessons learned:

- Ensure that your venue knows that a wheelchair accessible facility is a mandatory requirement for you using their facilities and that last minute changes are not acceptable unless they maintain the same level accessibility.
- Trainers in the UK have a legal obligation to ensure that disability or any other protected characteristic does not limit a persons ability to participate in training.
- Ensure that coffee and lunch breaks are close to the training location, ideally without the need for stairs or lifts in between.
- Do not assume that the attendee will inform you of their needs: attendees may prefer to make their own arrangements and enquiries so it is essential to ensure that any changes to venue and accessibility are made clear to attendees.



Case study: wheelchair accessible venues

A course delegate registered for an event and requested wheelchair access. The event was being held at a location that was not the trainers home institution, but was being provided for free. The hosts initially advised that the venue was not accessible and that no other venues were available.

Further research revealed that the venue was wheelchair accessible, through an alternative route into the building.

Lessons learned:

- Thorough research can often reveal that a location is wheelchair accessible, but the route to the venue may need to be modified.
- The trainers had the legal responsibility to provide an accessible training venue, not the hosts, who instead have a responsibility to ensure they provide accessible rooms for their own events and students.



Visual disabilities

Visual disabilities or visual impairment is a decreased ability to see to a degree that causes problems not fixable by usual means such as glasses. The term blindness is used for complete or nearly complete vision loss.

There are many adjustments that people may take individually to improve/accommodate their own visual impairment which are important for a trainer to appreciate: attendees may bring a guide dog, require help to find a chair, need seating near the front of the room or bring their own assistive technologies.

As trainers we may be asked to provide a wide variety of accommodations including:

- Providing larger print material, or in a special format allowing magnification or reading machines to convert to a format the delegate can access. For example equations may need to be provided in LaTeX as many assistive technologies cannot interpret mathematical equations but can read out the corresponding LaTeX commands.
- Attendees may need preferential seating or you may need to guide the attendee to a seat.
- Materials may be required further in advance than would normally be necessary to enable the delegate to prepare.

Best practice

- Avoid making statements that can not be followed by someone without sight (e.g. 'This diagram sums up what I am saying').
- Be prepared to provide material in a variety of formats.
- Always provide material three days in advance and be prepared that you may be asked for it even earlier in certain situations.

Case study: providing printed material in different formats

On the first day of a training course a visually impaired delegate requested that the material was provided in a larger font than standard. The material had been produced in LaTeX, with a complex style file running to many pages, making quick changes almost impossible.

Lessons learned:

- Ensure your materials are in a format that can be easily adapted: you may not be able to predict every requirement possible, so the ability to easily change is essential.
- Attendees may not realise that apparently simple adaptations such as font size are difficult if tools are being used that they are not familiar with.

Psychological disabilities

The term 'psychological disabilities' covers an extremely broad range of impairments that are often unseen and present differently for each individual. The term includes depression, bipolar disorder, severe anxiety and much more. Students will often not wish to disclose information to you, and may fear the reaction of others, particularly as currently many of the disabilities that would be classed as psychological are poorly understood and often poorly accepted by society.

Best practice

- Do not press students to explain their disabilities if they do not wish to.
- Students may miss class, be late, leave the room in the middle of a class – they are responsible for catching up, but appreciate that they may ask for help to fill in the gaps.
- Be respectful: don't jump to conclusions about why someone appears lazy, grumpy, or misses classes.



Accommodating deaf or hard of hearing disabilities

- 1 in 5 people have some form of hearing impairment
- Many people lip read, some extremely adeptly
- Communication may be through the use of sign language, gestures, writing, language interpreters
- Always speak directly to the student not the interpreter
- During discussions ensure one person speaks at a time
- Do not lose visual contact – avoid giving out information while handing out papers
- Provide seats near the front
- Use captioned videos whenever possible
- If a classroom must be darkened, then ensure that a student's interpreter is clearly visible
- When reading from text provide a copy in advance to participants
- When working with the chalkboard or overhead system, pause briefly to allow student to look at the screen then interpreter/you

Case study: using a microphone

At a workshop, a microphone was available but was not being used by any of the speakers. The room was small, so many presenters and the organiser felt that the use of microphones was unnecessary.

During the Q&A at the end of the day one of the attendees complained that they had not been able to fully follow the talks because they were hearing impaired, and if the microphone had been used they would have been able to use the induction loop supplied in the room.

Lessons learned:

- Always attempt to book a venue that provides microphones (ideally lapel microphones to enable speakers to move away from a fixed podium) and a hearing loop.
- If microphones are provided always use them, even if they do not appear to be necessary.
- Do not assume your audience will tell you that they cannot hear.

Accommodating disabilities: general best practice

There is no 'one-size-fits-all' solution in accommodating a disability but in general we advise:

1. After registration provide participants with the opportunity to inform you of any accommodations that they may need. This may be done through an additional form, and can include providing information on requirements other than those to do with disabilities, such as dietary restrictions.
2. Always use a microphone: 1 in 5 people have some form of hearing impairment, and even in a small room it can be difficult to hear particularly when people are working together in small groups. It is common practise to ask the question 'Can you all hear', but this is often done in a raised voice that is lowered for the rest of the session.
3. Always use rooms equipped with a hearing loop.
4. Always use rooms that are wheelchair accessible, and with wheelchair accessible coffee and toilet facilities nearby.
5. Be aware that lunch, coffee and toilet breaks will take longer for mobility impaired attendees and ensure that there is plenty of time if necessary to travel between the venue and catering facilities.
6. Only talk to the audience when you are facing them: when writing on a whiteboard etc. try not to talk.
7. Answer questions by ensuring it is clear what the question is. It is not necessary to repeat the question verbatim, but the answer can often incorporate the key parts of the question.
8. Provide material to participants in advance of the event so that attendees can download and view the material either in print or on their local device during the session.
9. Ensure the font size and colour of your training material can be easily changed if required.

Broadening participation

Beyond accommodating individuals with particular needs there is a general desire to improve the inclusivity of all of our training, to broaden participation and encourage individuals to participate who may not otherwise feel that they are welcome.

It is important to ensure that any minority group is included. Be aware that even if you do not perceive any individual as 'different' or in a minority grouping, the individual may feel differently. In addition, remember that being part of a minority is not the only reason why individuals may feel uncomfortable participating.

The following actions will often improve the experience for all attendees.

1. Ask for personal information towards the end of the registration process, in particular names and any identifying characteristics such as gender should be the last items collected. This minimises the impact of 'stereotype threat' whereby the delegate is reminded that they are in a group that has a negative stereotype while completing the form, and may then start to exhibit the stereotyped traits simply because they have been reminded of this, intentionally or otherwise.
2. Tailor your course timings to your expected audience: if you expect mainly local delegates, ensure they have enough time to do the school run by starting your day later and finishing earlier. If you expect mainly non-local delegates who have travelled, perhaps leaving behind a family, run longer days to minimise the time away from home.
3. Provide all materials and a detailed timetable in advance of the course, so that delegates that can not attend the first day can still make use of subsequent sections of the course.
4. Use HackPad or similar to share information with and between delegates during a course and afterwards, removing the need to read a whiteboard that may be difficult to see, have additional typos due to transcribing or difficulting reading handwriting, or with poor lighting.
5. Minimise the perception a delegate has of drawing attention to themselves when asking questions: use SkypeChat or similar to allow discrete communication between a delegate and the tutor during a course or provide all delegates with sticky notes that can be attached to laptops to indicate that they are fine or they have a question.
6. Use inclusive language when advertising courses encouraging participation from groups that may otherwise feel they do not belong in the field, even though they may gain valuable insight. Avoid placing mandatory requirements on potential course delegates as this requires the potential attendees to self-report their level of experience, introducing differences based on cultural background, personalities and gender.
7. Consider running courses targeted at minority groups to encourage participation, ideally ensuring that at least some of the trainers conform to this minority.
8. Ensure there are plenty of breaks and time for networking.
9. If possible provide catered lunches, or a venue for participants to eat a lunch they have brought with them as breaks are often viewed as a crucial time for networking.
10. Ensure that catering provides for dietary requirements, particularly if there are limited food outlets nearby. Small catering outlets are often unable to provide for dairy free, gluten free and halal diets.

Stereotype threat: the situational predicament whereby individuals feel themselves at risk of confirming negative stereotypes about their social group.



In a recent study of applicants for an HPC course, participants were asked to self-report their level of experience on a scale of one (inexperienced) to five (expert). Males self-rated their level of experience statistically significantly higher than female respondents on eight of the 21 items. However, a direct assessment of the participants showed that there was no statistically significant difference in their performance. (Study awaiting publishing)

Be considerate

One of the most important aspects in broadening participation and ensuring that course attendees gain the most from your event is to find out what the needs of the audience are in advance. However, it is important to remember that participants are under no obligation to tell you their requirements. This can at times be frustrating, but often the individual will not want to share more than they feel is absolutely essential.

Remember:

- You are only expected to help if you have been told
 - Try and minimise any barriers there may be in asking for help or making you aware of their requirements.
 - Provide an opportunity for participation to contact you with information on any adjustments needed but disassociate this from being accepted for a course. Any real or perceived association with the registration and acceptance process may stop the individual from attending and/or stop the individual from telling you the adjustments required.
- Don't assume anything about someone's behaviour: you do not know what happened to them last week or this morning!
- Being late or having a bad day may not be their fault: many people will have very good reasons they don't want to share with you, but it is easy to jump to often negative conclusions about someone's behaviour and change your own behaviour to them because of this.
- Understand that many people with disabilities may just 'make do' because they don't want to be seen making a fuss – we need to work to reassure them that we want to help (and act that way ourselves when we need help!)

Further information

This guide has been developed by the team that runs training for the UK National HPC facility, ARCHER (www.archer.ac.uk). We aim to share our experiences and the best practise we have learned over many years of teaching and lecturing, but we are not experts in the field. We therefore encourage you to make full use of any local resources you may have available and ensure that you abide by any local legislation (in particular in the UK, the Equality Act 2010).

<http://www.ed.ac.uk/student-disability-service/staff/supporting-students>

<http://www.ecu.ac.uk/guidance-resources/>

<https://www.gov.uk/government/publications/employing-disabled-people-and-people-with-health-conditions/employing-disabled-people-and-people-with-health-conditions>

<http://www.teachingvisuallyimpaired.com/accommodations.html>

<http://www.legislation.gov.uk/ukpga/2010/15/contents>



Feedback

If you would like to provide any input to this guide, provide feedback on how useful the material was or suggest additions we would be delighted to hear from you. Please contact us at:



Diversity in HPC

EPCC, School of Physics and Astronomy
The University of Edinburgh
James Clerk Maxwell Building
Peter Guthrie Tait Road
Edinburgh
EH9 3FD

Telephone: +44 (0) 131 650 5030

Email: info@hpc-diversity.ac.uk