Amplifying the Voices of Disabled Scientists

Dr Julia Sarju

Email: julia.sarju@york.ac.uk

June 2024 UK Horizons in STEM Higher Education

Defining Disability

UN Convention on the Rights of Persons with Disabilities (CRPD): "…disability is an evolving concept and that disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others"

Disabling:

- Attitudes
- Environments
- Behaviours

What's on the agenda?

- Landscape for Disabled Scientists
- Case Studies:
  - 1: (In)accessible Labs, Student & Staff Collaboration
  - 2: Inclusive Student Internships: Accessible Digital Resources
  - 3: Sensory experiences in Chemistry Teaching Labs
- Highlighting Networks

Landscape: Exclusion of Disabled Scientists

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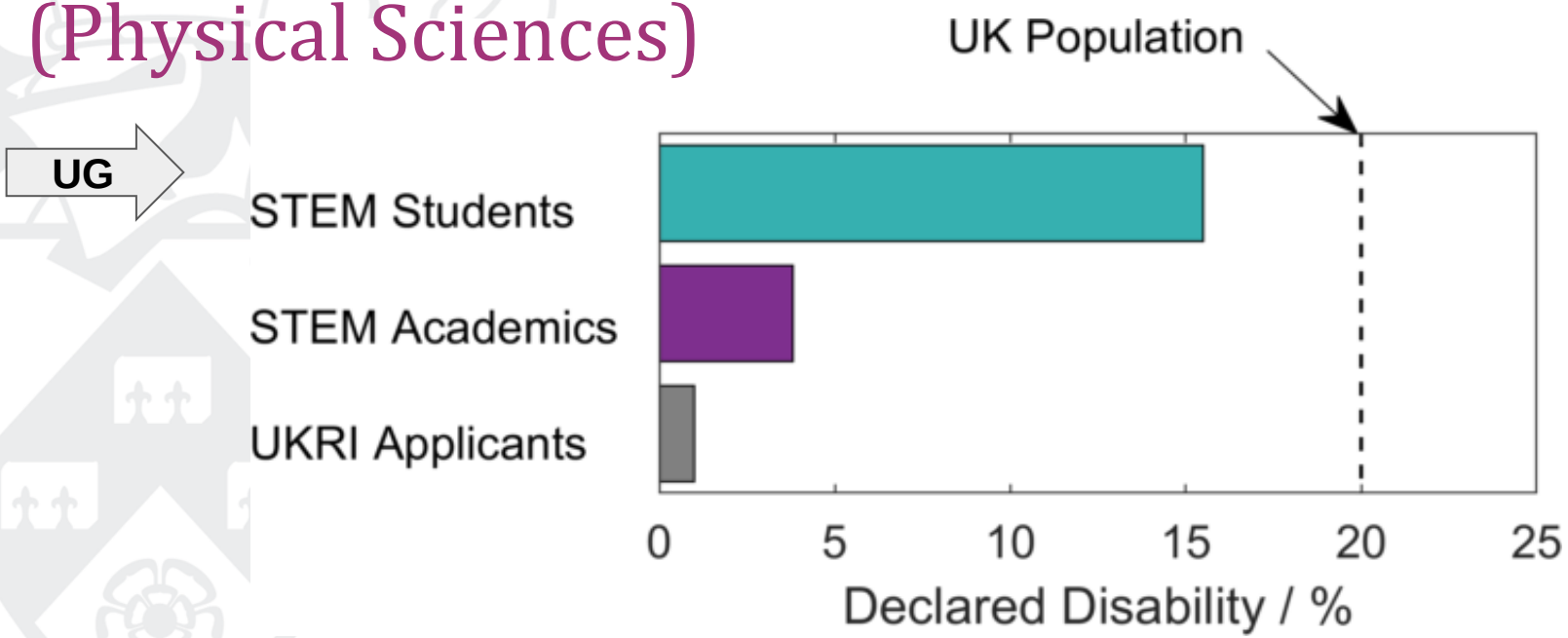
Disability Exclusion in the UK

- Data is an underestimate
- Disabled People = 22% of the total population (Department of Work & Pensions 2022)
- 2021 Census: highest rates of disability are reported for "White: Gypsy or Irish Traveller" (33% in England) and "Mixed or Multiple ethnic groups: White and Black Caribbean" (22% in England).

Disability Exclusion in the UK Academia

- 18% of undergraduate students declare a disability (HESA, 20-21)
- Autistic graduates x2 more likely to be unemployed after 15 months than non-disabled graduates (Buckland Report)
- 15% of postgraduate students (HESA, 20-21)
- 5% of academic staff declare a disabling condition (HESA, 20-21)

Unequal Participation in Academia (Physical Sciences)



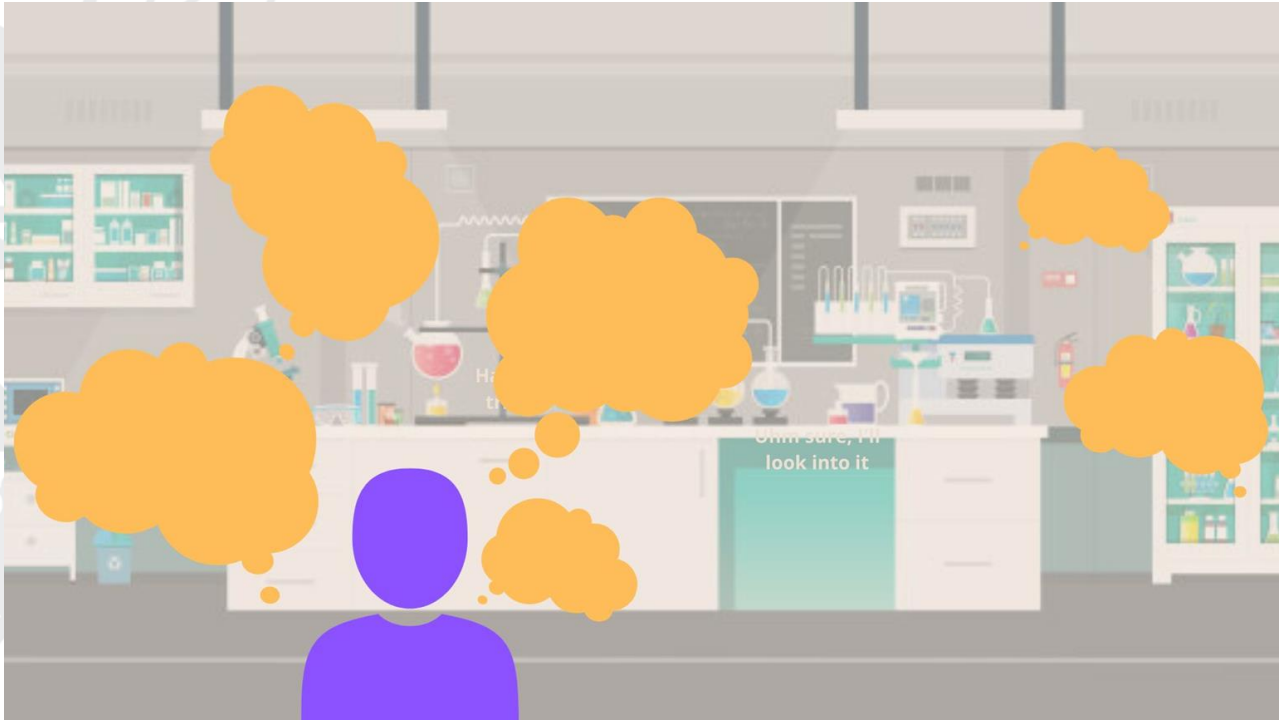
Julia P. Sarju, Nothing About Us Without Us – Towards Genuine Inclusion of Disabled Scientists and Science Students Post Pandemic, *Chem. Eur. J.*, 2021

Factors affecting Disability Declaration

- Personal
- Involve weighing up of perceived and actual risks versus benefits
- Internalised Ableism
- Stigmas
- Lack of understanding of what disability means

Freely Available e-book Ableism in Academia, Theorising experiences of disabilities and chronic illnesses in higher education, Edited by Nicole Brown and Jennifer Leigh

Accessibility of Lab Environments



Inequity in STEM Labs

Inaccessibility

Chilly Environments & Discrimination

Gendered Task-Distribution

Sense of Belonging

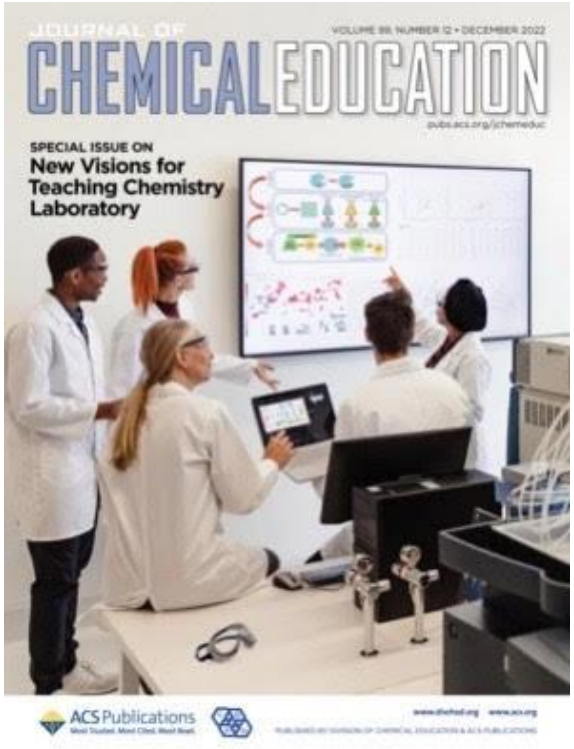
Inaccessibility: Egambaram **2022**; Royal Society. **2020**.; *L. Wilson et al., NADP UK, 2020* **Chilly Environments and Discrimination:** Park, J. J. *et al.* **2020**; Neill, *et al.* **2019**; Jensen, L. E.; Deemer, E. D., **2019;** Barthelemy, R. S. *et al.* **2016**.; Stentiford, L. J **2019**. **Gendered task distribution:** Doucette, D *et al.* **2020** **Unequal Sense of Belonging:** Fink, A. *et al.* **2022,** RSC **2021**

What can we do?

Case Studies: Partnerships Driving Change

- 1: (In)accessible Labs, Student & Staff Collaboration
- 2: Inclusive Student Internships: Accessible Digital Resources
- 3: Sensory experiences in Chemistry Teaching Labs

Case Study 1: Student & Staff Collaboration: (In)Accessible Labs

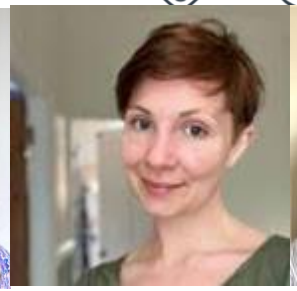


The Future of Laboratory Chemistry Learning and Teaching Must be Accessible Orielia Egambaram, Kira Hilton, Jennifer Leigh*, Robert Richardson, Julia Sarju, Anna Slater, Bethan Turner, Journal of Chemical Education, 2022, 99, 12, 3814–3821

Accessible Chemistry Labs






Orielia Egambaram, PhD University of Kent

Kira Hilton, PhD University of Kent

Dr Jennifer Leigh, Reader in Higher Education & Academic Practice, University of Kent

Dr Robert Richardson, PDRA, STEMenabled.com

Dr Julia Sarju, Lecturer in Chemistry Education, University of York

Dr Anna Slater, Senior Lecturer in Chemistry, University of Liverpool

Bethan Turner, MChem, University of Liverpool

Accessible Chemistry Labs: Collective Autoethnography

….Disabled students often get demoralized when the academic culture surrounding them holds a conventional wisdom that they are unlikely to succeed, and if they do succeed, it means that it is unlikely that they are truly disabled and so should not have had accommodations…

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Accessible Chemistry Labs: Collective Autoethnography

….The dominant culture within chemistry seems to suggest that a “good chemist” can work long hours and know “all” the reactions. A disabled student may strive to reach these expectations at the expense of their health….

RSC Accessible Labs Focus Groups

"I had to go part time because of health reasons" PhD student

"Different doesn't mean less productive" PhD student

"My mobility aids are seen as an inconvenience." PhD student.

"Labs can be intimidating – there is such a focus on stuff like memory, vision etc… this is hard if you have brain fog! You wear glasses if you need them, but you don't get the same for cognitive issues." PI.

Leigh, Sarju, Slater, Belonging and Identity in STEM when you are disabled, chronically ill, or neurodivergent, UCL Press, coming July

RSC Accessible Labs Focus Groups

"a lot of things that are raised are not [only] accessibility, it's about general health and safety and good practice" (health and safety officer)

"I stayed at the same university because of support, but will there be consequences for that?" "yes" PDRA

"Ivory tower ableism is not accepting of illnesses, and there is a culture of not taking holidays or sick leave" PhD student

Leigh, Sarju, Slater, Belonging and Identity in STEM when you are disabled, chronically ill, or neurodivergent, UCL Press, coming July

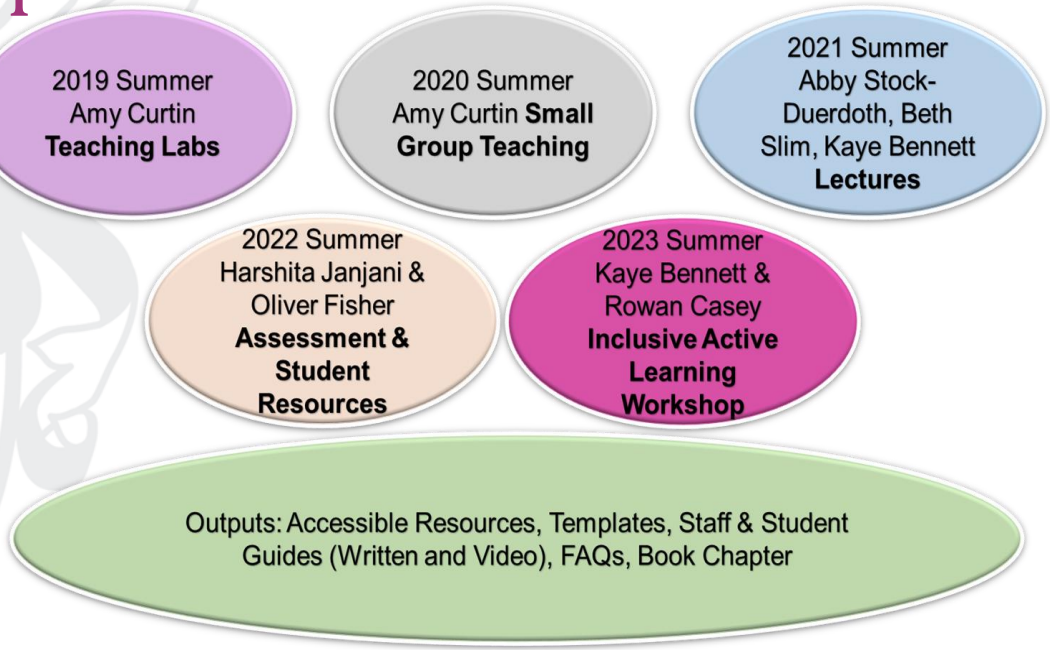
Accessible Chemistry Labs - Recommendations

Building in accessibility to laboratories:

- **physical adjustments**, automatic doors, lighting in cupboards, lab support, often facilitated by technical staff #TechniciansMakeItHappen
- **accessible resources,** lab manuals, reporting procedures, assessments
- and **changes to the culture of chemistry**.

Case Study 2: Inclusive Student Internships: Accessible Digital Resources

Digital Accessibility Student Partnership

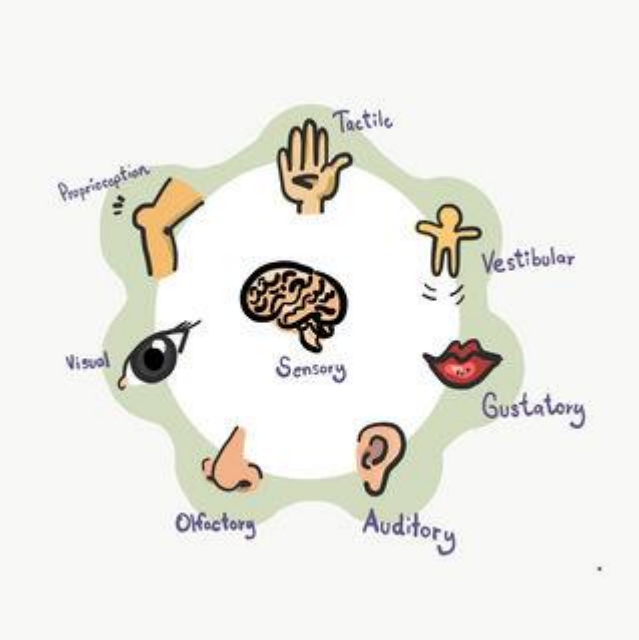


Amy L. Curtin and Julia P. Sarju, **Students as Partners: Co-creation of Online Learning to Deliver High Quality, Personalized Content**, Advances in Online Chemistry Education. 2021, Chp. 10, 135-163.

Abby, Kaye, & Beth Key Messages:

- Accessibility benefits everyone
- We need to be **actively inclusive**
- Student partnerships allow students to feel their voices are being heard and making change
- Remote internships allow for students to have an accessible space to be heard and make a difference

Case Study 3: Sensory Experiences in Chemistry Labs



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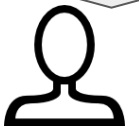
What is Sensory Overload?

Overstimulation of 1 or more of the body's senses

'When my environment is overstimulating and affecting one or more of my senses, making it difficult to process what's going on/surroundings or making it harder to focus.'

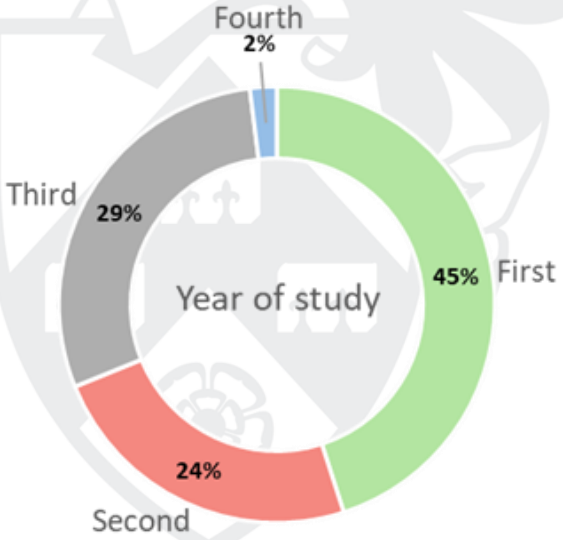


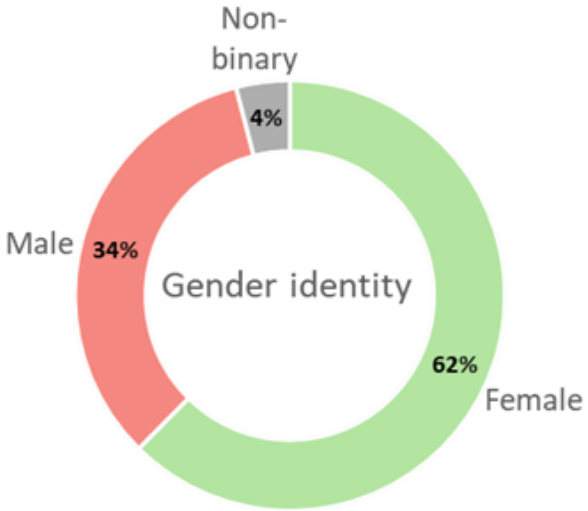
Sensory Overload

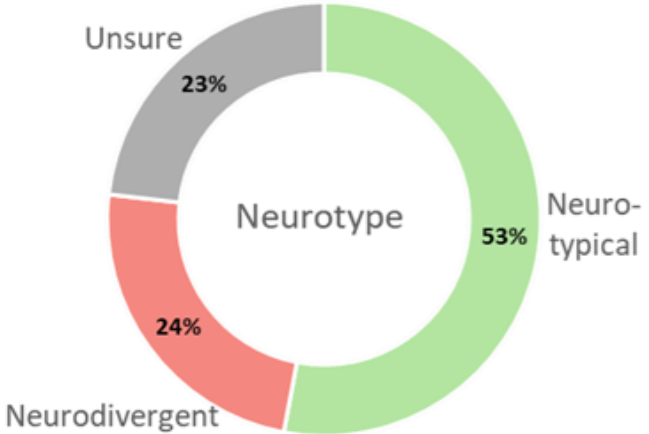
Flaherty, A., The Chemistry Teaching Laboratory: A **Sensory Overload Vortex** for Students and Instructors? Journal of Chemical Education 2022

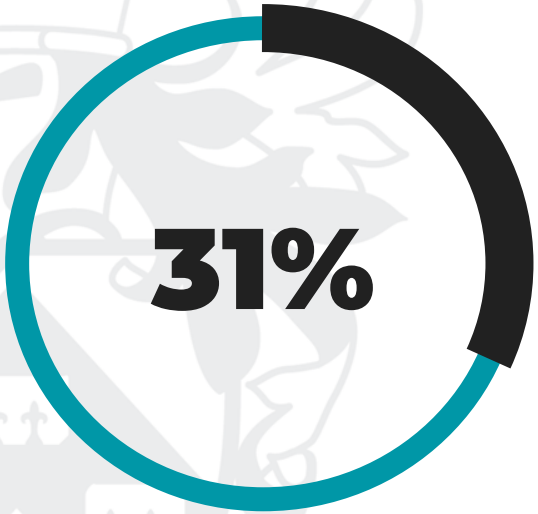
Data Collection

- Survey (N = 151, ugrad UoY)
- Interviews (N = 6, ugrad and GTA UoY)



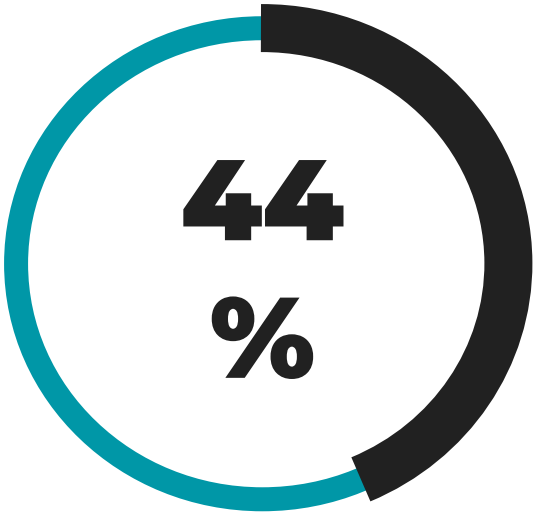






EXPERIENCE SENSORY OVERLOAD IN THE LAB

Before information



EXPERIENCE SENSORY OVERLOAD IN THE LAB

After information

Triggers

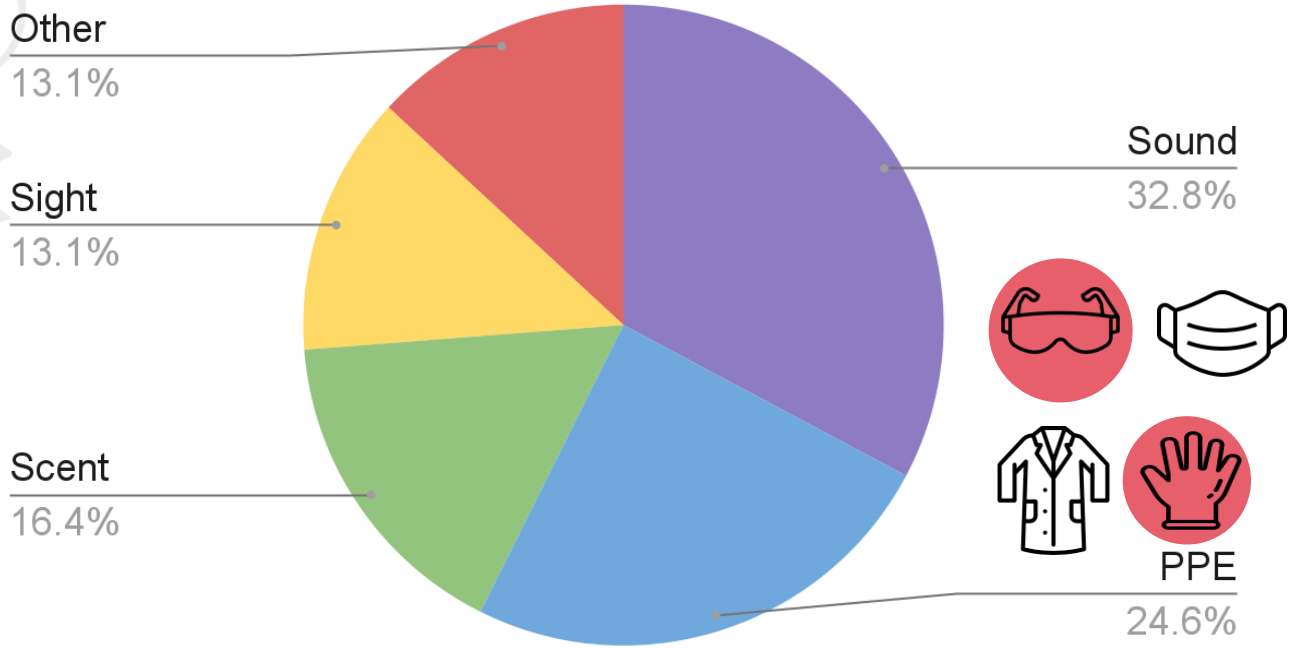
Restricted movement

Time pressure

Temperature

Other People

Frequency of triggering stimuli



Triggers: Sound

Consequences of Sensory Overload

1. STRESS
2. MAKING MISTAKES
3. FALL BEHIND
4. HAVE TO STAY LONGER
5. LESS TIME LEFT IN THE DAY TO COMPLETE OTHER WORK

‘I prioritise making it through the day rather than getting everything done’

Consequences of Sensory Overload

1. STRESS
2. MAKING MISTAKES
3. FALL BEHIND
4. HAVE TO STAY LONGER
5. LESS TIME LEFT IN THE DAY TO COMPLETE OTHER WORK

‘Get to the point where I break down and can’t respond any more’

Potential Triggers Checklist

- Upgrade fluorescent lighting to LEDs to prevent flickering,
- Provide zoned or separate work spaces,
- Avoid cluttered work areas, e.g. Clear bench tops,
- Avoid excessively colourful wall decor,
- Regularly service equipment to reduce noise,
- Where possible, move loud machinery to support rooms, or seek to minimise its use.
- **Provide time and space for breaks to allow for rest and recovery from sensory stress and overload.**

Recommendations

- **Consultation and Partnership:** address intersectional barriers, meet real rather than perceived need, “nothing about us without us”. Be clear that neurodivergent staff and students are expected and welcome. .

Expect diversity: may not share disability information and even when this is shared, you may not be aware. Proactivity and inclusivity.

Recommendations

Centre intersectionality: Unique and compounded barriers

Raise awareness: Educate students and staff about neurodiversity, sensory overload, and coping strategies. How to access support and adjustments.

Create a friendly environment: encourage students and staff to feel safe sharing their access needs

Sensory Overload In Your Context

- What sources of sensory overload are present in your learning and teaching environments?
- How might sensory overload impact students' learning and wellbeing in your discipline?
- How might sensory overload contribute to experience and awarding gaps?

Student & Staff Networks

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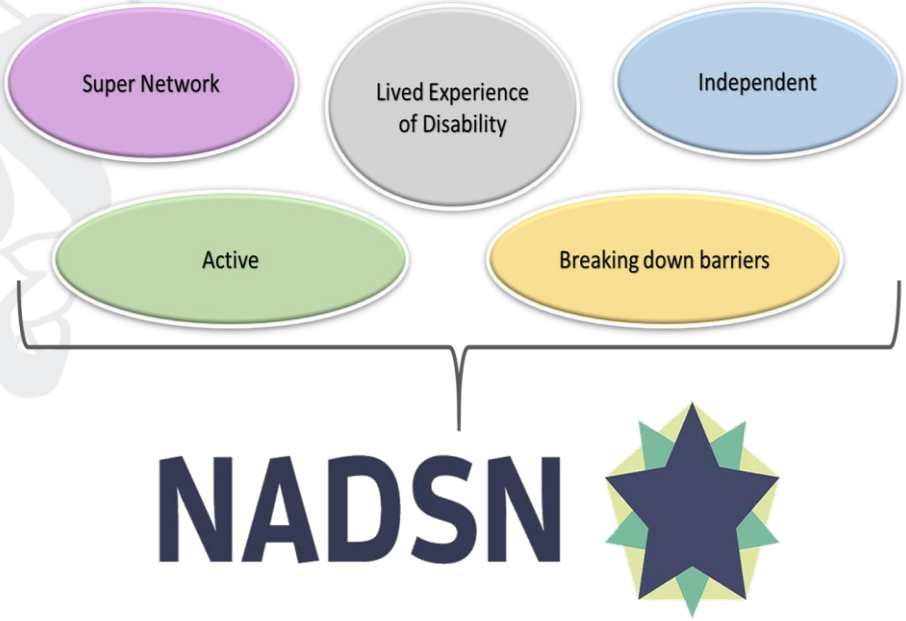
What do Staff Networks mean to their members?

"Support networks provide a place of belonging, invaluable for those with stigmatizing and misunderstood conditions. They are a place of acceptance and unconditional emotional and practical support." Dr Gayle Brewer

National Association of Disabled Staff Networks



nadsn-uk.org

Enable Science

Partner of the RSC

Mission:

- The Enable Science Network supports disabled individuals to succeed in science.
- Working to increase representation of disabled scientists and improve their sense of belonging.

Women in Supramolecular Chemistry: Collectively crafting the rhythms of our work and lives in STEM

UNIVERSITY of York

W.I.S.C.

Women In Supramolecular Chemistry

Leigh et al. 2022 Bristol: Policy Press

https://policy.bristoluniversitypress.co.uk/women-in-supramolecular-chemistry

shorturl.at/ATVY9

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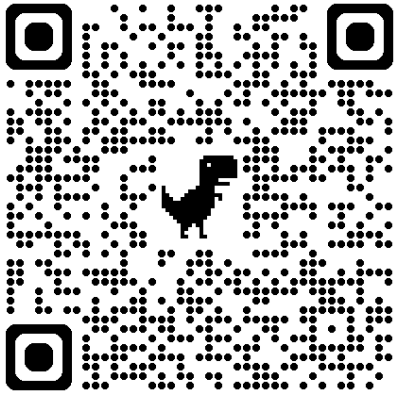
Concluding Thoughts

- In addition to adjustments we need to transform cultures
- Need to listen to lived experiences
- Plan for inclusive partnerships
- Networks are doing important inclusion work
- **There are lots of opportunities to get involved!**

Thank you for listening



↑ **Link to Slides**

Any questions?