

## **Department for Business, Innovation and Skills Targeting funding for disabled students in Higher Education from 2016/17 onwards: Response from the STEMM Disability Advisory Committee**

### **The STEMM Disability Advisory Committee<sup>1</sup>**

The STEMM Disability Advisory Committee was formed in 2011 to bring together professional bodies and learned societies for Science, Technology, Engineering, Maths and Medicine (STEMM) in order to provide a clear and authoritative voice on the inclusion of disabled people in STEMM education and employment. Our partnership aims to bring collective action and a strategic approach to strengthening the inclusion of disabled people in STEMM and believes that by working collaboratively and having a common purpose, we can maximise impact. We are committed to supporting a more diverse science workforce and our constituent bodies are committing time and resources to achieve this.

In forming our response, all our member bodies were consulted<sup>2</sup>. The STEMM Disability Advisory Committee welcomes the government's efforts to ensure that the higher education learning environment is accessible to all students. We agree that a move to a more inclusive learning environment at all levels of education, training and employment is a positive step. As demand for workers with high-level science qualifications increases, the UK needs to encourage and facilitate more people to study science-based subjects. Higher education plays a valuable role in training a highly-skilled science workforce.

Below we highlight a number of issues regarding the specialist support often required by disabled STEMM students, particularly around the lack of expert and specialist knowledge that exists in HE. We want to make certain that disabled STEMM students do not face additional disadvantages as a result of the government's proposals.

As professional bodies, we welcome involvement in discussion about the definition of an inclusive learning environment in STEMM, what generic reasonable adjustments are agreed as standard and how, for some organisations, this might potentially impact upon, and be supported by, our degree accreditation processes.

### **Question 1: Do you think a minimum level of reasonable adjustments for all HE providers could help ensure a consistent approach to making reasonable adjustments? If yes, what areas do you think should be covered.**

Yes. A minimum level of reasonable adjustments for all HE providers will ensure that there is a consistent approach for all disabled students no matter what they choose to study or where. All students should have a genuine choice of HE provider, based

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<sup>1</sup> Members of the Committee are: British Computer Society (BCS), Campaign for Science and Engineering (CaSE), General Medical Council (GMC), Institute of Physics, (IOP), Royal Academy of Engineering (RAEng), Royal Society, Royal Society of Biology, (RSOB), Royal Society of Chemistry (RSC), Science Council, Wellcome Trust.

<sup>2</sup> The BCS will be submitting its own response to this consultation, independently of the STEMM DAC; Science Council and the GMC are not official signatories to this response although both organisations support all efforts to ensure disabled people can access higher education on an equal basis to their non-disabled peers.

on their choice of course (e.g. theoretical, experimental, practical, etc.), location and on what HE provider will best meet their needs. Without a minimum level of sector-wide support, disabled students will have to make choices based solely on the provision offered to accommodate their needs; this is not a genuine choice. In STEMM subjects, a minimum level of reasonable adjustments should be agreed at the subject level with professional body involvement, if appropriate. These adjustments should not adversely affect the overall student experience and should be supported by professional bodies' degree accreditation processes. However, the emphasis should be on the institution to ensure all graduating students have met the learning outcomes for the particular degree programme if the degree is to be awarded. It is likely that provision for disabled students in chemistry or physics degrees at different institutions is more alike than between, for example, a chemistry and a music department at the same institution. We welcome engagement in discussions on agreeing a common definition of an inclusive learning environment in a STEMM context.

**Question 4: Do you think that the Government's preferred option for non-medical help changes fulfils the policy rationale of making HE as accessible as possible?**

No. There appears to be little acknowledgement within the consultation that students on different courses will face subject-specific challenges and barriers, particularly in a STEMM context. There needs to be much greater recognition that contact hours in STEMM subjects can be higher than in non-STEMM subjects, given the amount of lecture, tutorial, fieldwork, lab work and placement learning that takes place. This leads to huge increases in the amount of support required for all students, much of which will be individual-specific and not generic, as implied in the consultation.

Any changes to the way that Non-Medical Help (NMH) support is delivered must take account of this and establishing an Exceptional Case Process may be particularly detrimental to STEMM students who are likely to need access to specialist and subject-specific additional support. It is simply not clear how the needs of STEMM students will be accounted for under the proposals, given the greater requirements that they may have. For example, one physics student with dyslexia received a number of different adjustments to enable her to study including note-takers, one-to-one support, and specialist study skills support. It is not clear if she would have to go through an Exceptional Case Process for all three different types of NMH if the HEI did not provide them all.

**Questions 7-12: Non-Medical Help (NMH) Categories**

For all bands of NMH Categories, it is not clear whether most cases for disabled STEMM students may end up being taken through an Exceptional Case process or whether maths-based courses will be treated separately. Only under Band 2c is there a statement that exceptions may be made if specialist knowledge is required to, for example, capture formulae; dealing with formulae is commonplace in most, if not all, STEMM subjects. STEMM academics typically do not have the expert knowledge in dealing with assistive technologies, nor is a typical HE central disability officer or practitioner with the assistive technology knowledge likely to have the

necessary STEM expert knowledge. Disabled STEM students themselves often end up being the experts and spend copious amounts of additional and avoidable time identifying their own solutions to software/ hardware conflicts between their assistive technology and subject-specific software.

In addition, in the final year of many STEM degrees, students undertake projects that involve real research, potentially working in cutting-edge fields. By their very nature (i.e. the research) the support the student requires at that time might be non-standard, and human support may be even more important. We do not want to see disabled students having a substantially reduced choice of projects as a result of a lack of support available to them.

In making any changes to the NMH support, the STEM Disability Advisory Committee wants to ensure that no disabled STEM students, at any point in their degree, are put at a disadvantage, particularly when they would have to rely on HE or departmental expertise and where that support is not necessarily readily available.

**Question 7: In NMH Band One categories are there any circumstances where the primary responsibility for provision should not sit with the HE provider?**

Yes. There is an assumption in the consultation that assistive software can relatively easily replace much of the human support that is currently provided. In STEM subjects this is often not the case. There are often many assumptions made, which include the notion that formulae, for example, can easily be converted into Braille (as Braille does contain mathematical code), or that all electronic texts can be made accessible (e.g. for example, through screen reading software). However, it is not always widely known that screen readers do not support mathematical documents such as those written in MathML or Microsoft's Equation Editor. It is not even widely known that elements of PDF documents are inaccessible to some screen readers, for example complex mathematical formulae, images of complex diagrams, etc. To further complicate matters, where an assistive technology solution exists, it may not interact with the specialist software required by the subject, e.g. *Mathematica* or *Chemdraw*. Therefore there will be occasions where DSAs are needed for Band One NMH support.

**Question 9: In NMH Band Two categories are there any circumstances where the primary responsibility for provision should not sit with the HE provider?**

Yes. Again, we would reiterate that there is an assumption that assistive software can fill the human support gap, which is not necessarily true in STEM subjects. In terms of examinations and note-takers, the specialist human expertise needed in STEM subjects to take notes or provide examination support is often crucial. One Chemistry student responded that *"The DSA has also funded a note taker for lectures which enables me to access the lecture content without worrying about getting the information rather than taking it in."* Therefore there will be occasions where DSAs are needed for Band One NMH support.

**Question 16. Do you agree that the primary source of hard copy materials should be through an institution's library services to remove the need for individual printers, scanners and hard copy materials?**

Not entirely. Disabled STEMM students may face additional delays and difficulties in this process, given the specialist nature and language of STEMM-subject material and converting this material into a form that is accessible. For many STEMM subjects, it is the non-linear nature of the text that presents barriers, given that there are few screen readers that can cope with complex mathematical or other formulae. Whilst it is clear that for the majority of students accessing plain texts may be the most cost-effective solution, there needs to be support retained for STEMM students who may face additional problems in this process. For example, a dyslexic student using a screen reader who would benefit from the flexibility of being able to print materials in an accessible format (print size, colour differentials, etc.). Not all published texts contain original source material that is accessible (for example, if the original author draft is in pdf format). Many STEMM courses may introduce new material highlighting the latest "cutting-edge" research to bring the course to life and it may take some time to source the original text in order to convert it to an accessible format. Having a personal printer means that in these cases the student can access the course material more quickly and easily.

**Q22: How should any changes introduced be monitored and evaluated to ensure students are receiving a consistent service and are not being disadvantaged?**

No mention is made of the differences that are going to be experienced by students funded by SFE and those from the devolved nations. We welcome further clarification on this issue. There must be a commitment to compare the retention and progression of SFE-funded students and their equivalents from across England and the devolved nations. Likewise, there must be a commitment to students to ensure there is ongoing monitoring of the participation in HE by disabled STEMM students to make certain that any of the issues highlighted above are not barriers to their participation.