

# **IOP** Institute of Physics

## **Submission to the Migration Advisory Committee call for evidence on international students: economic and social impacts**

**25 January 2018**

The Institute of Physics is a leading scientific membership society working to advance physics for the benefit of all. We have a worldwide membership ranging from those early in their career or in academic or technical training to those at the top of their fields in academia, business, education and government. Our purpose is to gather, inspire, guide, represent and celebrate all who share a passion for physics. And, in our role as a charity, we aim to ensure that physics delivers on its exceptional potential to benefit society. Alongside professional support for our members, we engage with policymakers and the public to increase awareness and understanding of the value that physics holds for all of us. Our subsidiary company, IOP Publishing, is a world leader in scientific communications, publishing journals, eBooks, magazines and websites globally.

The IOP welcomes the opportunity to submit evidence to the Migration Advisory Committee's call for evidence on the economic and social impacts of international students. Our written evidence concerns the importance of international students to UK universities and institutions and for physics and we address the relevant consultation questions here.

### **Summary**

- **International students<sup>1</sup> make up 11% of undergraduate students, 43% of taught Masters' students and 39% of PhD students in UK physics departments.**
- **The impact on higher education institutions of student fee payments by physics students from non-UK countries varies depending on the level of study. The impacts are more substantial for postgraduate level courses.**
- **The impacts of migrant students on the educational opportunities available to UK students are positive. The demand for UK higher education from international students makes more courses viable, particularly at postgraduate level, leading to more choice for UK students.**
- **Science and research are extremely collaborative. The international nature of science and research is supported by a number of mechanisms that encourage the international mobility of scientists at all career stages, including international students temporarily in the UK.**
- **The presence of international students on UK courses enhances the learning experience for UK-domiciled students, providing them with collaboration in an international learning environment.**

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<sup>1</sup> When using the term 'international' we are referring to non-UK EU and non-EU domiciled students in accordance with HESA descriptors which can be found at <https://www.hesa.ac.uk/support/definitions/students>.

- Unless the cap on Tier 2 visas is amended or removed, transferring students to the Tier 2 (General) visa would have implications for both international students and other migrants who may wish to use this route to work in the UK
- The ability of migrants to mitigate skills shortages and students to study in the UK, who may later enter the labour market upon graduation, may be affected if the cap proves to be restrictive.
- A longitudinal study of nearly 6000 physics graduates, which included non-UK EU and non-EU domiciled students, published by the IOP in 2012 found that more than half (52.4%) of respondents were continuing with education one year after study: 3.7% were in teacher training, 39.2% were in employment, 6.5% were unemployed.<sup>2</sup>
- A reduction in demand of international students coming to study in the UK could lead to increased funding pressures on physics departments, in some cases leading to course closures and funding issues across the sector. Over longer timescales, there may be missed opportunities for collaborations, which can often start from the development of informal networks during study.
- As the upward trend in research productivity has been linked to growing international research collaboration,<sup>3</sup> in turn associated to greater citation impacts, reduced levels of collaboration could result in a slowing in the growth of the UK's research base. There would also be immediate losses to the research base as many PhD level students make important contributions to research papers during their studies.

### **International students in UK physics**

International students make up a significant proportion of UK physics students. Non-UK EU students make up 6% of undergraduates, 16% of Masters' students and 20% of PhD students in UK physics departments. These proportions are higher than for all subjects combined: 5% of undergraduates, 9% of Masters' students and 13% of PhD students are from non-UK EU countries.

On the other hand, non-EU students make up a further 5% of undergraduate physics students, 27% of Masters' students and 19% of PhD students in UK physics departments. These proportions are smaller than for all subjects combined, where non-EU students make up 9% of undergraduates, 38% of masters students and 30% of PhD students.

### **Consultation questions**

#### **What impact does the payment of migrant student fees to the educational provider have?**

The impact of student fee payments of physics students from non-UK countries on higher education institutions varies depending on the level of study. Non-UK EU students at undergraduate level currently pay the same as their UK counterparts. While non-EU students pay more, they make up a small proportion of physics students, so may have

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<sup>2</sup> The remaining respondents are classified as 'other', which encompasses career breaks, voluntary work or other further study options.

<sup>3</sup> Elsevier and BEIS, 2017. International comparative performance of the UK research base 2016. [https://www.elsevier.com/\\_data/assets/pdf\\_file/0018/507321/ELS-BEIS-Web.pdf](https://www.elsevier.com/_data/assets/pdf_file/0018/507321/ELS-BEIS-Web.pdf)

limited additional financial benefits. At postgraduate level, the impacts are greater: postgraduate taught students in physics pay considerably more than UK students and make up a substantial proportion of the cohort. At PhD level, the financial benefits to institutions are more difficult to assess. There may also be disproportionate impacts on institutions, particularly in London, which have larger proportions of international students than the average.<sup>4</sup>

There are high costs associated with teaching physics. Several physics departments were forced to close in the early 2000s, which led to departments being provided with extra funding from HEFCE as part of their support for 'strategically important and vulnerable subjects'.<sup>5</sup> However, overall funding has been capped, so funding per student has declined in recent years. Budgetary difficulties may increase the dependence of some departments on the payment of fees from migrant students, particularly if they are in deficit.

At undergraduate level, 6% of physics students are non-UK EU domiciled, although this is not uniform across all UK nations. Non-UK EU students in Scotland make up 12% of the cohort compared to 5% in England and 3% in Wales. According to research published by Times Higher Education for the 2016-17 academic year,<sup>6</sup> UK and non-UK EU students paid an average of £8,891 annually for courses at universities in England. Non-EU students paid more; an average of £15,034 for laboratory based subjects. On average, these students only make up 5% of the undergraduate physics cohort, so their impact on departmental income at most institutions will be small.

There is also a large difference in the fees charged for postgraduate taught students between UK/ non-UK EU students and non-EU students: in 2016-17, UK and non-UK EU students paid an average of £6,486 for courses at universities in England, and for non-EU students, the cost for laboratory based subjects was £15,638 annually. In physics, 27% of postgraduate taught students come from non-EU countries, suggesting that tuition fee payments from international students are likely to provide income for physics departments.<sup>7</sup>

### **How do migrant students affect the educational opportunities available to UK students?**

The impacts of migrant students on the educational opportunities available to UK students are positive. The demand for UK higher education from international students leads to a larger number of viable courses, particularly at postgraduate level, and can enhance the learning experience for UK-domiciled students.

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<sup>4</sup> UKCISA. International student statistics: UK higher education. <https://www.ukcisa.org.uk/Research--Policy/Statistics/International-student-statistics-UK-higher-education>

<sup>5</sup> HEFCE, 2011. Evaluation of HEFCE's programme of support for SIVs. [http://www.hefce.ac.uk/media/hefce/content/pubs/indirreports/2011/RE\\_0511\\_Evaluation\\_of\\_SIVs/rd05\\_11.pdf](http://www.hefce.ac.uk/media/hefce/content/pubs/indirreports/2011/RE_0511_Evaluation_of_SIVs/rd05_11.pdf)

<sup>6</sup> THE, 2017. Annual tuition fee data for full time courses at UK institutions, 2016-2017. [https://www.timeshighereducation.com/sites/default/files/breaking\\_news\\_files/annual-tuition-fee-data-for-full-time-courses-at-uk-institutions-2016-2017.pdf](https://www.timeshighereducation.com/sites/default/files/breaking_news_files/annual-tuition-fee-data-for-full-time-courses-at-uk-institutions-2016-2017.pdf)

<sup>7</sup> IOP and the Royal Society of Chemistry, 2015. The Finances of Chemistry and Physics Departments in UK Universities: Third Review. [http://www.iop.org/publications/iop/2015/page\\_66517.html](http://www.iop.org/publications/iop/2015/page_66517.html)

There is currently no limit on how many undergraduate students universities can take on since the cap on UK and EU student recruitment was lifted in 2015,<sup>8</sup> although in physics there can be limits imposed by the requirements for teaching and laboratory space. Courses offered at universities are based on student demand, so the demand of international students for physics courses at UK universities will also influence the opportunities available to UK students. Investment is needed to maintain teaching standards (student: staff ratios and laboratory facilities), which requires a stable situation for long term outlook. The proportion of non-UK EU and non-EU students at undergraduate level is low in most institutions, so the effect would be small at this level, but at Masters' level where international students make up a higher proportion of the cohort,<sup>9</sup> the demand from them is more significant.

The presence of international students has led to the availability of MSc programmes which would not otherwise be offered to UK students. If international students did not come to study in the UK, there would be costs beyond the availability of the course itself, as international student fees can support departmental budgets more broadly. The reduced funding could result in cuts to equipment, student support and cause pressure on staff. In severe cases departments could be forced to close, with consequences for staff, their careers and UK physics research as a whole.

The training of international students in UK universities can produce high-quality scientists that may return to the UK later in their career. All students will benefit from being taught by staff at the top of their field in the subject, which relies on recruiting teaching staff from all over the world.

### **What role do migrant students play in extending UK soft power and influence abroad?**

Science and research are extremely collaborative: more than half of all UK research articles in 2014 resulted from international collaboration, ranking second amongst comparator countries in that year.<sup>10</sup> This demonstrates the international nature of science and research, which is supported by a number of mechanisms that enable the international mobility of scientists at all career stages, including international students in the UK.

It is common for postdoctoral researchers to spend time overseas and research has found that non-UK nationals were more likely to have had longer stays abroad than UK nationals in the early and mid-career stages.<sup>11</sup> This mobility period is important for the strength of UK physics and to some extent will be built on the opportunities for international students at undergraduate and postgraduate level to study in the UK earlier in their career. The domicile data of postdoctoral researchers in physics departments reflects the mobility of this career stage: 61% of postdoctoral researchers in UK physics departments are from outside of the

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<sup>8</sup> BBC, 2013. Autumn statement: cap on student numbers to be lifted.

<http://www.bbc.co.uk/news/education-25236341>

<sup>9</sup> IOP, 2017. Students and graduates in UK physics departments.

[http://www.iop.org/policy/consultations/file\\_69759.pdf](http://www.iop.org/policy/consultations/file_69759.pdf)

<sup>10</sup> BEIS, 2017. International comparative performance of the UK research base 2016.

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/660855/uk-research-base-international-comparison-2016.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/660855/uk-research-base-international-comparison-2016.pdf)

<sup>11</sup> Royal Society, 2017. International mobility: A survey of academics in the UK.

<https://royalsociety.org/~media/policy/projects/international-mobility/researcher-mobility-report-survey-academics-uk.pdf>

UK.<sup>12</sup> International students, when they leave the UK, take back home new professional contacts with them to develop new international partnerships with UK scientists in the future, and share knowledge. Such partnerships may be especially important for obtaining funding from the Global Challenges Research Fund, which aims to boost international partnerships, especially in developing countries.<sup>13</sup> Alternatively, international students may choose to stay in the UK to further their career in academia, industry or elsewhere in the economy.

At undergraduate level, non-UK EU students also visit the UK to study for part of their course through programmes such as Erasmus+. Participation in these programmes is reliant on freedom of movement within the EU. This also offers reciprocal benefits to UK students visiting EU universities and the benefits of such programmes, including funding and skills development for participants, have been documented in the mainstream press.<sup>14,15</sup> Aside from Erasmus+, programmes such as Marie Skłodowska-Curie actions programme, part of Horizon 2020, assist in developing the quality of UK research by attracting talented PhD students as well as early career researchers to the UK.

### **What are the broader labour market impacts of students transferring from Tier 4 to Tier 2 including on net migration and on shortage occupations?**

Transferring students to the Tier 2 (General) visa would have implications for both international students and other migrants who may wish to use this route to work in the UK. If students are added to the same quota, it could restrict the total number of migrants entering the UK to mitigate skills shortages and for international students to study, who may later enter the labour market upon graduation.

The UK currently has a shortage of STEM skilled workers and concerning gaps in the skills pipeline, partly caused by a lack of specialist physics teachers.<sup>16</sup> Both EEA and non-EEA migrants currently mitigate this skills shortage, as well as bringing different expertise, experience and cultural perspectives to the UK. Physics teachers, physical scientists and engineers are all currently on the UK Tier 2 shortage occupation list.<sup>17</sup> Furthermore, the 2016 CBI survey found that 90% of engineering, science and hi-tech businesses are expecting an increased demand for STEM skills in the next 3-5 years.<sup>18</sup> If students were to be included in Tier 2, it could reduce the availability of visas for migrants to enter the UK to fill jobs in these areas, further exacerbating the shortage of skilled STEM workers.

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<sup>12</sup> IOP, 2017. Academic staff in UK physics departments.

[http://www.iop.org/policy/consultations/file\\_69758.pdf](http://www.iop.org/policy/consultations/file_69758.pdf)

<sup>13</sup> Gov.UK. UK strategy for the Global Challenges Research Fund.

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/623825/global-challenges-research-fund-gcrf-strategy.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/623825/global-challenges-research-fund-gcrf-strategy.pdf)

<sup>14</sup> Times Higher Education. UK students 'may be barred from Erasmus after Brexit'.

<https://www.timeshighereducation.com/blog/uk-students-may-be-barred-erasmus-after-brexit>

<sup>15</sup> BBC, 2017. Erasmus loss post-Brexit 'would be massive' in Wales. <http://www.bbc.co.uk/news/uk-wales-42052393>

<sup>16</sup> IOP, ASE, RSB, RSC and RS response to the Education Select Committee on the supply of teachers, 2015. [http://www.iop.org/policy/consultations/file\\_66631.pdf](http://www.iop.org/policy/consultations/file_66631.pdf)

<sup>17</sup> Gov.UK. Shortage Occupation List. <https://www.gov.uk/guidance/immigration-rules/immigration-rules-appendix-k-shortage-occupation-list>

<sup>18</sup> CBI 2016. The right combination. CBI/Pearson Education and skills survey 2016.

<http://www.cbi.org.uk/cbi-prod/assets/File/pdf/cbi-education-and-skills-survey2016.pdf>

It is appropriate that students have their own route to coming to the UK as their visit is different to that of a migrant worker and the current system allows for this. The UK leaving the EU provides the opportunity to make the immigration system work for everyone and we will look forward to the forthcoming white paper on this topic. The development of an effective migration policy will be a vital component of the future success of UK science as international students play a crucial role in that. As such their social and economic impacts must be considered fairly in a new immigration system.

### **Whether, and to what extent, migrant students enter the labour market, when they graduate and what types of post-study work do they do?**

Government LEO data<sup>19</sup> provides statistics on the employment and earnings of higher education graduates by subject and institution. Although it only assesses UK-domiciled students, there is no reason to believe the labour market is different for migrant students. According to the 2017 LEO data, 84.3% of physical sciences students were in further study or sustained employment one year after graduation. Five years after graduation, this figure was 82.1%.

A longitudinal study of nearly 6000 physics graduates, which included non-UK EU and non-EU domiciled students, published by the IOP in 2012 found that more than half (52.4%) of respondents were continuing with education one year after study. 39.2% were in employment, 6.5% were unemployed and 3.7% were in teacher training.<sup>20</sup>

For graduates who do not go on to further study for a Masters Level or PhD qualification, employment is varied. The IOP study found the most respondents were working in education, finance and scientific and technical industries. Popular career destinations within science include the armed forces, astronomy, medicine, meteorology and climate change, nanotechnology, oil and gas and renewable energy.<sup>21</sup>

### **Consequences of there no longer being a demand from migrant students for a UK education**

A reduction in demand of international students coming to study in the UK could lead to increased funding pressures on physics departments, in some cases leading to course closures and funding issues across the sector. Over longer timescales, there may be missed opportunities for collaborations, which can often start from the development of informal networks.

The higher education sector is a global market and if international students increasingly choose other places to study, other countries will eventually overtake the UK in international student recruitment. The UK may lose talented students who may go on to further study or skilled jobs and may be less likely to choose the UK as a career destination. Additionally, UK students will not benefit as they do now both socially and professionally, from studying in a diverse environment.

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<sup>19</sup> Gov.UK. Graduate outcomes for all subjects by university. <https://www.gov.uk/government/statistics/graduate-outcomes-for-all-subjects-by-university>

<sup>20</sup> IOP, 2012. The Career Paths of Physics Graduates. [http://www.iop.org/publications/iop/2012/page\\_55925.html](http://www.iop.org/publications/iop/2012/page_55925.html)

<sup>21</sup> IOP. Your future with physics: career directions. [http://www.iop.org/careers/undergrad--postgrad/your-future/page\\_64487.html](http://www.iop.org/careers/undergrad--postgrad/your-future/page_64487.html)

A reduced demand from migrant students could also result in missed opportunities for collaborations. As the upward trend in research productivity has been linked to growing international research collaboration,<sup>22</sup> in turn associated to greater citation impacts, reduced levels of collaboration could result in a slowing in the growth of the UK's research base. There would also be immediate losses to the research base as many PhD level students make important contributions to research papers during their studies.

## **Conclusion**

International mobility is an essential feature of science and engineering in the UK and developing an effective migration policy is a vital component of future success – international students are a contributor to that. As such, these impacts would be detrimental to the UK higher education, research and technology sector.

Changes to UK immigration policy post Brexit should ensure that the UK retains its position as a destination of choice for qualified students from non-UK EU and non-EU countries. There should be a continuous dialogue between current and prospective students, universities, government and other bodies to ensure the best outcome for the UK and secure the future of the STEM skills pipeline and the higher education system.

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<sup>22</sup> Elsevier and BEIS, 2017. International comparative performance of the UK research base 2016. [https://www.elsevier.com/\\_data/assets/pdf\\_file/0018/507321/ELS-BEIS-Web.pdf](https://www.elsevier.com/_data/assets/pdf_file/0018/507321/ELS-BEIS-Web.pdf)