

Northern Ireland Election 2016



The Institute of Physics in Ireland is a scientific membership society devoted to promoting physics and bringing physicists together for the benefit of all. We have over 2000 members and are a part of the Institute of Physics, a charitable organisation and leading scientific society.

The Northern Ireland Assembly election on 5 May is a chance to build upon Northern Ireland's scientific pedigree and help to inspire future generations. This briefing outlines the actions we believe the next Northern Ireland Executive should take in the areas of primary, secondary and higher education, innovation and advice that can help to secure Northern Ireland's scientific future.

Primary education

Science opens up a world of opportunities for young children, leading them to think more analytically, ask more questions, and take more notice of the world around them.

Children exposed to science from an early age can begin to pursue and develop their own interests and talents in the subject, opening more doors for them in secondary education, in higher education and in their careers.

However, there is no separate delivery of science in primary schools in Northern Ireland. Science is delivered as part of a wider curriculum alongside history and geography and there is no statutory duty on teachers to teach these subjects equally. Only 3.5% of registered teachers in primary schools have a science qualification.

As such, primary school students in Northern Ireland are likely to have far less of a clear and positive understanding of science from a young age than those of other UK nations and many, particularly those from some of the most deprived backgrounds, are likely to have had no scientific stimulus until they reach secondary education.



The next executive should review the primary curriculum and explore ways to re-introduce a separate science subject into primary schools.

Secondary education

Students who study physics in school are in particularly high demand and physics is one of the most frequently cited facilitating subjects for science, technology, engineering and mathematics (STEM) and also for non-STEM degree courses.

Physics graduates have high earning potential (see graph overleaf), and their skills are valued in a huge range of jobs. Students deserve to benefit from a physics education and should have an equal opportunity to study physics.

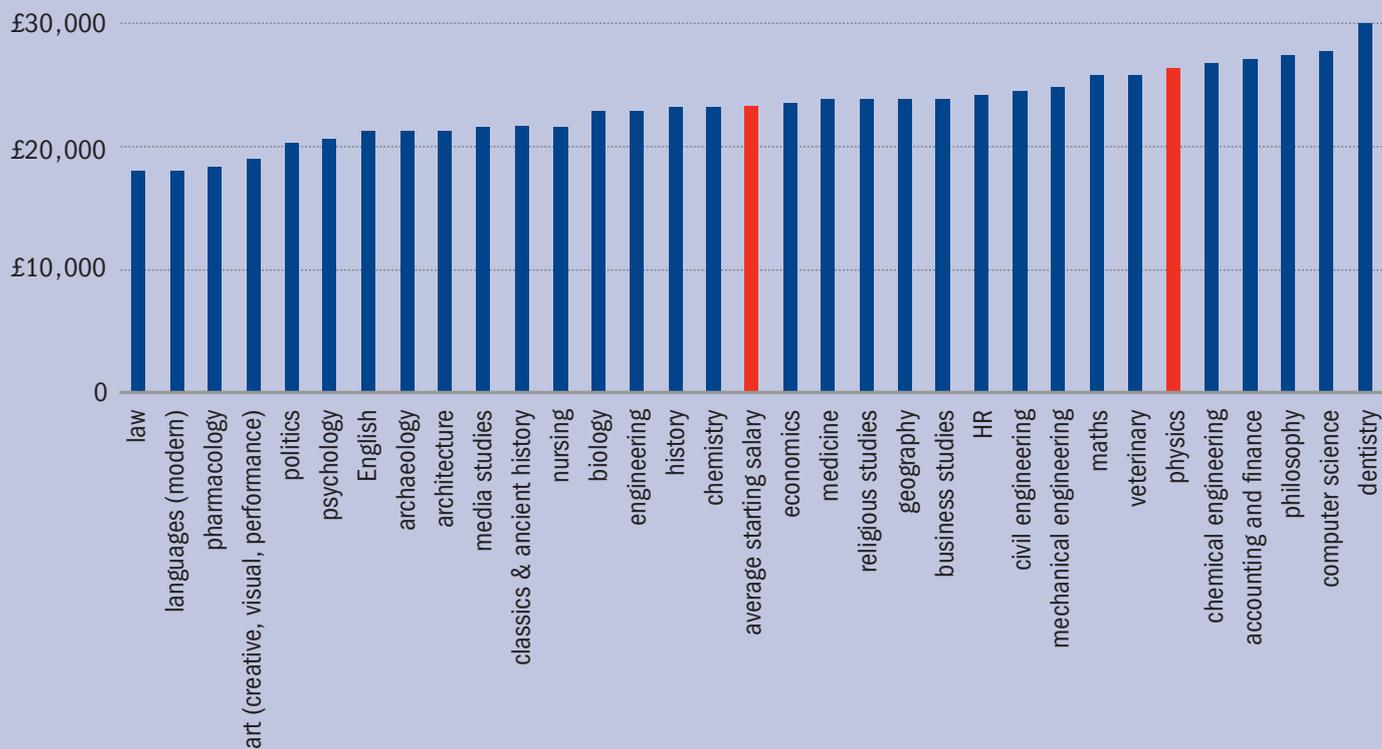
A-level physics is mostly only available to students in grammar schools, which make up around 30% of second-level schools. Although non-selective schools will have physics available up to GCSE level, they frequently will not offer physics at A-level.



The next executive should conduct a review to identify and tackle the barriers to physics becoming a realistic option to pursue at A-level for all students.



Average starting salary of selected degree subjects



HESA Data 2015

Currently, only 14% of registered teachers have any kind of science or maths degree. There are currently around 200 physics teachers in Northern Ireland, but two thirds of these are in grammar schools. Those teaching in non-selective schools predominantly teach earlier years up to GCSE and there is little capacity to teach beyond this. The lack of access to A-level physics is both affected by, and further compounds, this problem, as it creates a block on the flow of students going on to physics degrees, some of whom will go on to train as teachers.



The next executive should invest in opportunities to increase the supply of STEM trained teachers, particularly physics teachers, including offering new funding to train and attract new teachers in Northern Ireland.

Higher education

Universities in Northern Ireland train the next generation of STEM-skilled graduates.

STEM graduates are in high demand, and estimates suggest that across the UK there is a need for 40,000 more STEM graduates a year. The engineering sector in Northern Ireland is no exception. Universities also provide crucial support and impetus for many of the innovative businesses that drive the Northern Irish economy, such as in high-tech manufacturing and aerospace engineering.

However, Universities in Northern Ireland receive between £1000 and £2500 less per student than universities in England. While tuition fees in both countries are capped, the lower cap of £3805 a year in Northern Ireland has not been met with additional funds to bridge the gap.

Without a sustainable solution, universities in Northern Ireland will have to make difficult financial choices in the coming years which could negatively affect the economy.



The next executive should commit to providing funding to close the gap between universities in Northern Ireland and England.



Innovation

Physics-based businesses in Northern Ireland make a huge contribution to Northern Ireland's economy.

Around 27,000 jobs in Northern Ireland are in directly physics-based sectors. Many major employers in high-tech manufacturing and engineering in Northern Ireland have some reliance on physics or employees with a strong background in physics – including Bombardier Aerospace, Caterpillar, Fujitsu and Seagate.

These sectors still have a lot of potential to grow in Northern Ireland, and physics has a huge role to play. Physics-based manufacturing contributes over 50% of manufacturing GVA in the UK as a whole but in Northern Ireland, that number drops to under 25%.

Physics-based manufacturing accounts for almost 48% of the manufacturing workforce in the UK but in Northern Ireland that proportion is under 30%. Economically, Northern Ireland is lagging behind the rest of the UK. It needs significant growth in high-tech manufacturing. Investing to grow physics-based businesses can help the Northern Irish economy to catch up.



The next executive should work with industry to review the manufacturing base in Northern Ireland and identify opportunities for growth in physics-based industries.

Chief scientific adviser

Government chief scientific advisers (CSA) provide an independent voice at the heart of government, ensuring that evidence is readily available to ministers to inform decisions.

There are CSA positions in Wales and in Scotland, and advising the UK Government itself. The UK CSA has the ear of the UK Government and is able to regularly feed in on government policy and strategy.

Northern Ireland is the exception in the UK. Policymaking in the Northern Ireland Executive would benefit from easy access to independent, scientific advice and evidence. The 2009 Report of the STEM Review, suggested that the Department for Education and the Department of Education and Learning, "supported by other relevant government departments, should introduce cross-departmental structures to help develop appropriate STEM strategies and policies. The structures should include a chief STEM adviser who would carry the educational responsibilities of a government chief scientist and a national STEM director". However, this was never acted upon.



The next executive should look to implement the recommendation from the 2009 Review of STEM to appoint a national STEM adviser and ensure that they have the ear of the Northern Ireland Executive.

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