

# Welsh Assembly Election 2016



The Institute of Physics in Wales is a scientific membership society devoted to promoting physics and bringing physicists together for the benefit of all. We have over 1000 members, and are a part of the Institute of Physics, a charitable organisation and leading scientific society.

The Welsh Assembly election on 5 May is a chance to build upon Wales's scientific pedigree and help to inspire future generations. This briefing outlines the actions we believe the next Welsh Government should take in the areas of teachers, schools and higher education that can help to secure Wales's scientific future.

## Teachers

Students from all backgrounds in Wales should be able to access the benefits of a STEM education, and to have this delivered by subject specialist teachers.

Specialist science teachers generate excitement and enthusiasm in their subject, and have been shown to raise attainment in students.

However, partly due to an inadequate supply of teachers, not all students in Wales are able to study A-level physics, and less than half of those teaching physics in secondary schools in Wales are trained in their subject. Although the number of physics teachers in the Welsh secondary school system has increased over recent years, many schools are still teaching students with a non-specialist teacher.

Currently, teachers that achieve an upper second degree have far greater financial incentives to train in England than in Wales, due to the respective levels of scholarship available in each.



The next government should provide financial incentives to support PGCE students that are at least as attractive as those offered in England.

English schools on average offer higher starting salaries for teachers. This means that Welsh or Welsh-trained teachers have significant financial incentives to teach in England, and that Welsh schools are at a competitive disadvantage in recruitment, particularly of the most in-demand teachers.



The next government should ensure that Welsh schools are able to offer salaries high enough to make them at least as attractive to new teachers as English schools.

Retaining those specialist teachers already in place and ensuring that existing teachers have the confidence to teach physics is important to ensure a long-term supply of specialist physics teachers.

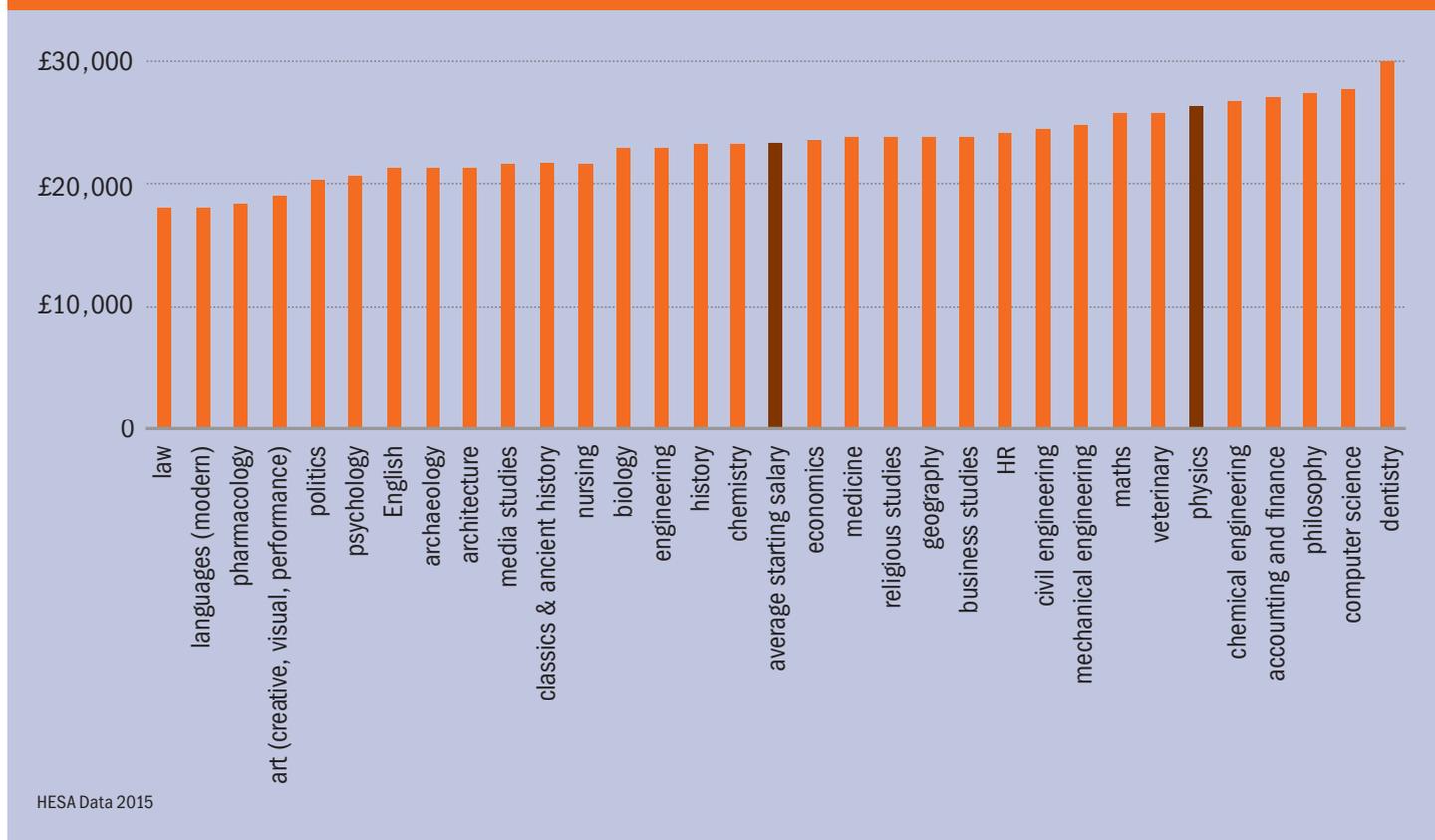
This is helped by ensuring that teachers are offered a range of continuing professional development (CPD) opportunities. Providing CPD can help to raise the confidence, ability and delivery of teachers. There already exist a number of such programmes in Wales, including for physics teachers, leading to increases in teacher retention, student attainment and progression rates, particularly for girls.



The next government should commit to continue and expand opportunities for CPD support for those teaching physics in Wales.



### Average starting salary of selected degree subjects



## Schools

Students who study science, technology, engineering and maths (STEM) subjects can open up a world of productive and lucrative careers in a vast range of different fields.

The current Welsh curriculum at Key Stage 4 (KS4) gives students a great deal of flexibility in their choices, and allows students with different interests and abilities to continue to pursue science at school at a level right for them.

However, it is important that the sciences maintain their distinctness and identity under any system at KS4. This will allow students to adopt and identify specialisations, and ensure all subjects are given sufficient attention. This should be part of the thinking behind the new curriculum for Wales, in development following the review of curriculum and assessment by Professor Graham Donaldson. It is important that science is recognised as a part of Wales's cultural heritage and its future prosperity, and this should be reflected in the curriculum adopted for Wales.

Students in Wales can choose from a range of options to study sciences at KS4, but there is evidence that some students who might ordinarily be studying science GCSEs are being poorly informed by schools.

For example, there has been a huge rise in the number of students in Wales who enter for a BTEC in applied science – rising from just 845 in 2009/10 to 11,645 in 2013/14. For some this might be appropriate, but courses such as these do not allow students to progress into scientific disciplines (including nursing, engineering and mechanical courses) post-16 should they chose to do so. As such, choices made without full information may end up leading students into a scientific cul-de-sac, restricting both opportunity and ambition for many at a young age.



The next government should maintain the principle of the sciences as separate subjects in their own right under the new curriculum for Wales.



The next government should ensure that students are made fully aware of the impact of their choices in science education in schools, and that good information is provided to all relevant stakeholders.



## Higher education

Public investment in science and research is a driver of economic growth, jobs and prosperity.

Recent research has found that private investment increases by £1.36 for every £1 of public investment made and an additional 29p from investment by Higher Education Institutions (HEIs) alone. Physics-based businesses, which are dependent on a strong research base and well-trained graduates, contribute £2.3bn to the Welsh economy in gross value added and employ 40,000 people. Welsh HEIs also produce high quality research: in the 2014 Research Excellence Framework, 77% of research in Welsh HEIs was found to be either world-leading or internationally excellent.

It is welcome that recent plans to cut the Higher Education Funding Council for Wales (HEFCW)'s budget by 32% were abandoned. However HEFCW still faces a budget reduced by around 8%. HEFCW provides important support for research in Welsh universities and this funding provides essential flexibility to universities and research institutes, enabling them to take risks, explore new avenues of research, and pursue excellence in line with their institution's strengths. Maintaining the strength of such a system is important for both curiosity-driven research, which underpins later success in applied research, and innovation bringing great economic, social, and health benefits. Such investment complements the Welsh Government's own research and innovation strategy.



The next government should commit to protect the HEFCW budget for research in real terms, and give universities the freedom to use such funding in line with their own research strategies.

STEM courses face particularly heightened financial pressure due to the higher costs associated with equipment and additional space required to teach them. STEM courses provide graduates with skills in high demand by employers. Any risk to the sustained provision of STEM courses in Wales would have a negative impact on the Welsh economy. In England, HEFCE provides support for strategically important and vulnerable subjects (SIVS), which provides departments, including those delivering STEM courses, with the additional financial support needed to maintain the viability to teach these important subjects.



The next government should commit to an allocation of funding in HEFCW's financial settlement to sustain the teaching of STEM courses in Wales.

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