

Dr David Cunah
The Institute of Physics
76 Portland Place
London
W1B 1NT

21/04/2015

Dear Professor Donaldson, Huw Lewis and Edwina Hart,

We are writing on behalf of the Institute of Physics regarding the recently published **Successful Futures** report and the subsequent **Great Debate** and to highlight some of our concerns which are not addressed in the on-line questionnaire.

An overriding concern is that responses from learned societies and subject associations appear to carry the same weight as responses from individuals. This is unreasonable given the considerable expertise and breadth of knowledge which the learned societies bring to the debate.

Many of the statements in the report are very general, and it would be hard to disagree with much of what is said. However, it is not clear that the four principles could be used to judge whether or not a curriculum was fit for purpose, whether it is properly balanced or whether it provided the appropriate grounding in the sciences. We would like to see a more detailed set of objectives that are not so open to (mis)interpretation

Additionally, the devil will be in the detail. It will be the way that this report is implemented which determines the success or failure of the Welsh education system. We therefore wish to offer some views on how the implementation might affect the teaching and learning of the sciences in Wales.

It has been widely noted that the report places significant importance on Wales' cultural heritage and the role this should play in the curriculum. Poetry, literature, music and religion are all mentioned within this context. There is a risk that emphasising these elements will be to the detriment of other subjects and that would be a backwards step. It is not clear on what evidence the decision to emphasise the four areas was based. We would be very interested to see the research that demonstrates the advantages of placing the focus on the arts and humanities, rather than either a balanced curriculum or an emphasis on STEM subjects. A conscious shift away from science and engineering would surely be viewed with surprise and disbelief from outside Wales.

Although it is obviously good for a nation to embrace its own culture, there is a risk that the curriculum will end up being backward-looking. We must look to the Wales of the future and how we will compete internationally in the digital age. Here, the capabilities and skills developed

through the sciences will be essential. We know that these skills are being sought by employers, and we know that they are what will enable Wales to build a strong economy through an innovative and entrepreneurial population.

We also have some concerns regarding the way the sciences will be taught. An abundance of research exists which shows that the teaching of science by subject specialists has a positive effect on the achievement and progression of students in these subjects[1][2]. There remains a great deal of uncertainty about how the areas of teaching and learning will be implemented; however, it seems possible that there will be 6 types of teacher (one for each of the areas of learning and experience). If this is compounded by an increased Welsh language expectation on teachers we would be deeply concerned that this would negatively impact the availability and recruitment of specialist physics, chemistry and biology subject teachers at secondary level.

We are pleased to note point 4 regarding assessment. It has long been our opinion that it is better to measure learner progression than arbitrary examination, and if this report results in the removal of league table systems which are open to tactical manipulation we would consider that a positive move.

We also notice that the report makes many references to the Scottish Curriculum for Excellence. It is worth noting that the Institute of Physics Teacher Network provided a considerable amount of support to the development of the curriculum in Scotland, and that would be substantial benefits to maintaining meaningful involvement from the learned societies in this process in order to ensure that the curriculum for science is fit for purpose.

It would be very useful for the timescales involved in the rollout of these changes to be clarified. Whatever is done, the pace of change needs to be sensible. It is important that useful components of what exists are not lost, and that subject integrity is not jeopardised by the move toward a broader curriculum.

Based on the above, we would welcome a chance to discuss the report in greater depth with you. We would very much encourage you to propose a date and place for a meeting by contacting our National Officer for Wales, David Cunnah, whose details are provided below.

Regards,

Professor Andrew Evans

Head of Physics, Aberystwyth University & Chair, IOP Wales

Philip Britton

Vice President, Education, IOP

Dr David Cunnah

National Officer for Wales, IOP

[1] Royal Society (2008) Science and mathematics education, 14–19. A ‘state of the nation’ report on the participation and attainment of 14–19 year olds in science and mathematics in the UK 1996–2007

[2] Department for Education and Skills (2007) Progression to post-16 science: interim report