SCIENCE IN THE CLASSROOM:
The School of the Future

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Since its inception in 2006, the All-Party Parliamentary Group (APPG) on Scientific Research in Learning and Education has heard about a number of issues but underlying these has been the need to translate scientific research relevant to education into the classroom. The group recently held a discussion forum to look at what a school of the future might look like in terms of use of scientific research.

The meeting was chaired by Baroness Greenfield and heard from four experts in the field of education. Opening the meeting were Professor David Reynolds, of Southampton University, a world-leading expert on teacher effectiveness, and Dr Paul Kelley, Headteacher of the innovative Monkseaton High School. Professor Reynolds began by stating that although education has undergone a series of changes, its rate of change is not as fast as many areas surrounding it and the dominant mode of teaching; one teacher to thirty pupils, has largely remained unchanged. He suggested that there is a number of reasons for this, not least the lack of applied research; with teacher effectiveness research, for example, being less prominent than research into the history of education. Additionally, he stated that the dominant model in education is one of apprenticeship with the pupils learning from the teacher and not an empirical model. A school of the future would involve shared databases, where schools could test ideas and create new thinking and communicate this thinking more widely. Critically, he suggested it was important to engage with mixed research methods ranging from action research to randomised controlled trials. Kelley then described some of the innovative practices implemented at Monkseaton High School. These included shifting the start of the school day back to 10am to fit better with the circadian rhythms of pupils and prevent some of the consequences of sleep deprivation hitting the classroom, including increased irritability, increased anxiety and decreased immunity. He also described the use of Spaced Learning in the classroom and suggested that outcome measures had shown clear improvement in pupils.

The meeting then heard from Dr Paul Howard-Jones, of Bristol University, about how gaming can be used in the classroom to support learning. Howard-Jones described the effects of computer gaming on the brain and, in particular, the effects on the mesolimbic dopamine pathway, which is implicated in motivational behaviours such as eating and sex. He described scientific research that showed dopamine levels increased the most in situations of uncertainty and that this dopamine response was indicative of the level of learning. He suggested that for science like this to impact on education three things needed to occur. Firstly, more research had to be done in areas relevant to education and this will require a dialogue to establish what is relevant. Secondly, studies needed to occur to check that effects found in the laboratory could be seen in the classroom. Finally, practice-based studies are needed, which merge with the teachers and therefore take advantage of their expertise. Howard-Jones then went on to describe how these three levels of testing had been used to develop gaming technologies in the classroom.

The final speaker for the meeting was Richard Churches, Principal Consultant for Learning and Teaching with the CfBT. He suggested that the problem so far has been a gulf in research methods between fields such as neuroscience and education, with the contrast between action research and controlled trials. He believed that it is possible to find suitable measures and control conditions for education research and therefore this way of thinking should be entertained. Finally he compared the current situation with the ideal future and suggested that we need to move from the politically driven approach that swings from pole to pole to a diagnosis and treatment approach. In terms of research methods, he felt that education needs to shift from being a one-trick pony using action research only to using a variety of methods, perhaps with schools combining in their efforts.

A lively discussion followed the presentations and it was clear that all speakers agreed that education can benefit from engaging with science and with scientific method and therefore as we look to the future we not only need to think "What" we should be investigating in education but also "How" and collaboration is likely to be a key factor in further development effective classroom strategies.

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Dr Dommett has asked us to point out that in her last article (vol 68 no 2 p 45) she should have referred to Dr Lauren **Stewart**, not to Dr Lauren Scott.