



THE ROYAL SOCIETY

# Royal Society says give neuroscience a greater role in education policy

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Scientists' growing understanding of the neurological basis of learning should play a much greater role in education policy according to a new report published by the Royal Society, the UK's national academy of science, today (24 February). The report also suggests that teacher training should include a component of how the brain works relevant to educational issues.

The new field of 'educational neuroscience' investigates some of the basic brain processes involved in learning to become literate and numerate; but beyond this it also allows us to understand how the brain learns to learn. Education changes the brain. The report authors, including neuroscientists, cognitive psychologists and education specialists, agree that if applied properly, the impacts of this emerging discipline could be highly beneficial in schools and beyond.

The Brain Waves Module 2 report says that training and continued professional development of all teachers should include aspects of neuroscience which are relevant to educators. At present neuroscience rarely features as part of initial teacher training courses. The report says that findings from neuroscience that characterise different learning processes could support and enhance teachers' own experiences of how individuals learn, be they in school, further education, higher education or in the workplace.

The report recommends in particular, that teacher training providers for Special Education Needs across all ages should consider including a focus on the neurobiological basis of learning difficulties such as dyslexia, dyscalculia and ADHD.

Professor Uta Frith FRS FBA FMedSci, chair of the working group involved in producing the report, says:

**Here is the link to the entire report - you'd need to type it out into your browser unfortunately, as it does not accept the click).**

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[http://royalsociety.org/uploadedFiles/Royal\\_Society/Policy\\_and\\_Influence/Module\\_2\\_Neuroscience\\_Education\\_Full\\_Report.pdf](http://royalsociety.org/uploadedFiles/Royal_Society/Policy_and_Influence/Module_2_Neuroscience_Education_Full_Report.pdf)  
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“Education is concerned with enhancing learning and neuroscience is concerned with understanding the mechanisms of learning. It seems only logical that the one should inform the other. Every day we are discovering more and more about how the brain works and if this information can help us to learn more effectively or hone the skills of the workforce, then we should be using it.

As a neuroscientist, I can see very exciting things on the horizon for our ability to learn but this does not mean we must rush ahead. Structures need to be put in place so that educators, psychologists and neuroscientists can speak to one another and decide which developments in neuroscience are useful and how best they can be applied in learning situations.”

The report also touches on cognitive enhancement which might manifest as improved problem-solving ability or memory, for example. This increased ability is usually linked with the targeted use of drugs or sophisticated technology. However the report’s authors suggest, that compared with these means, education in itself is the most powerful form of cognitive enhancement available to society.

So-called smart drugs, such as Ritalin or Modafinil, are conventionally prescribed to counteract cognitive deficits in diagnosed conditions like Attention Deficit Hyperactivity Disorder (ADHD) however they are increasingly being used ‘off-licence’ in people with normal brain function along with many other over-the-counter drugs. They’ve been used to overcome jet-lag, reduce the need for sleep, and boost motivation and concentration.

Professor Frith says:

“There’s a definite need for more research to establish the side effects of taking such drugs. This research is also going to have to take into account the ethical issues that arise from questions like access and fairness.

Education on the other hand is a natural cognitive enhancer, and is open to everyone. On top of typical educational attainment, we know that education can build up a person’s cognitive reserve and resilience, helping them think flexibly and adapt to stressful and traumatic events such as brain injury, mental disorder and normal ageing. Studies have found an inverse relationship between educational attainment and risk of dementia, meaning that keeping the mind active slows cognitive decline and improves our cognitive abilities when we age.”

The report also calls on the Technology Strategy Board to promote knowledge exchange and collaboration between basic researchers, front-line practitioners and the private sector in order to inform and critically evaluate the impact and development of new adaptive learning technologies such as brain-training computer games.

Professor Frith concludes:

“Education is about more than just learning new things. It affects our health, wealth and happiness, allowing us to transcend the physical limits of our biological evolution. The rapid progress in neuroscience research is producing new information that has the potential to help us understand teaching and learning in new ways.

The economic and social costs of an education system that does not facilitate learning for all and learning throughout life is high. This is why we are calling on those involved in education at all its levels to begin to think about how insights from neuroscience can enhance the process.”

The full report Brain Waves Module 2: Neuroscience: implications for education and lifelong learning can be downloaded here: <http://royalsociety.org/policy/reports/brainwaves2/>

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