

Learnus™

Understanding Learning

www.learnus.co.uk

“Understanding Learning - is it all in the brain?”

Mediated Workshop

Wednesday June 26th

Drama Studio, Institute of Education



How could neuroscience influence education? (and vice versa!)

Prof. Michael Thomas

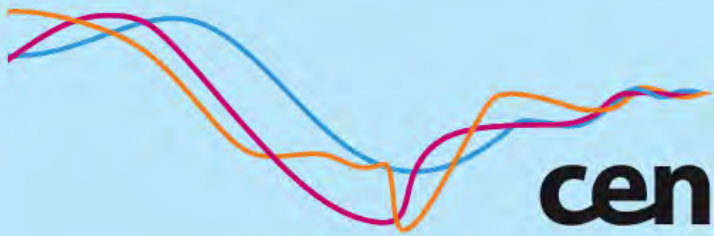
Director, Centre for Educational Neuroscience

LEARNUS Mediated Workshop

26 June 2013

Outline

- The emergence of educational neuroscience (EN)
- What some teachers would like from EN
- Neuromyths
- How teachers and neuroscientists might interact
- What the future might hold
- Today's discussion topics



Centre for Educational Neuroscience

An inter-institutional transdisciplinary project



Neuroscience



Education



Child development

Cambridge University



Centre for Neuroscience in Education

[Home](#) [News](#) [Jobs](#) [Research](#) [People](#) [Public Understanding of Science](#) [Publications](#) [Links for parents, teachers and students](#)

[University of Cambridge](#) > [Centre for Neuroscience in Education](#)

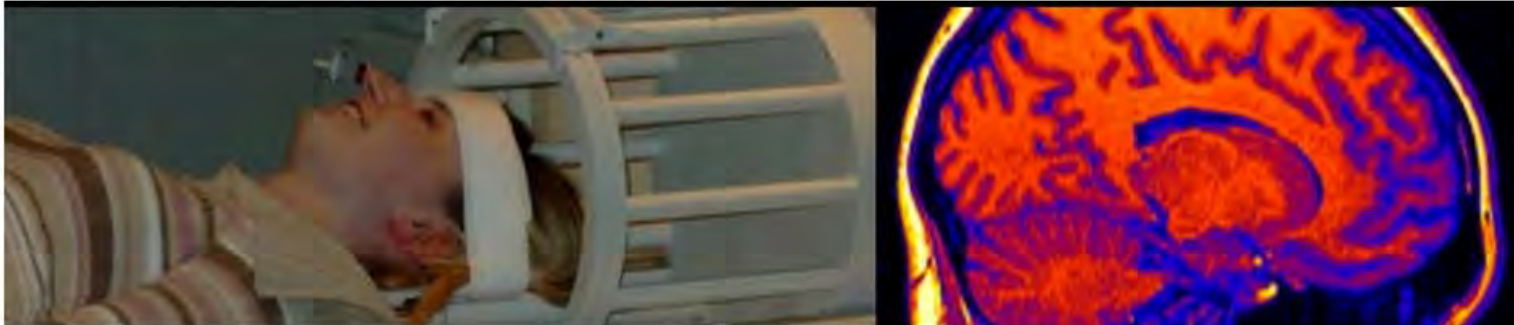
The Centre was established in 2005, and was the first of its kind in the UK. We are based in the School of Biological Sciences (Department of Psychology) on the [Downing Site](#) but we also have strong links with the Faculty of Education. The Centre's aims are to apply the substantial advances in understanding the brain to education.

The main research goal of the Centre is to establish the basic parameters of brain development in the cognitive skills critical for education. For example, we aim to understand how the brain functions and changes during the development of reading and maths, exploring the development of related skills such as language, memory, numerosity and attention.



Bristol University

neuroeducational.net



[Home](#) [Resources](#) [Twigg and Team Play](#) [Join the mailing list](#) [Study Opportunities](#) [Further Info](#)

NEnet is an information network hosted by the Centre for Mind and Brain in Educational and Social Contexts (M-BESC) at the [Graduate School of Education, University of Bristol](#). NEnet seeks to distribute neuroeducational information and resources that educators may find helpful.



Dr Paul Howard-Jones

LearningRx

Train the brain. Get smarter. Guaranteed.

- HOME
- BRAIN TRAINING 101
- WHO WE CAN HELP
- OUR PROGRAMS
- ABOUT US

Brain Training 101 Where am I? >> Brain Training >> Brain Training 101

I used to struggle to keep up with my friends at school.
Then my parents found the cause.



Brain Training 101

- The Science Behind Brain Training
- How Brain Training Works
- How Do We Know Brain Training Works?
- What Can Brain Training Mean to You and Your Family?
- Brain Training Rewires Brains & Changes Lives

Brain Training 101: How Brain Training Works



Whenever you think, learn, or remember, groups of neurons in your brain physically work together to accomplish the task. If what you're trying to do is difficult or unfamiliar, nearby neurons are drawn into the process to help you out.

LearningRx brain training exposes each student to a customized series of intense mental workouts. To perform these workouts, the brain is forced to strengthen, reorganize and even create new neural pathways. In other words, brain training "rewires" the brain to perform more efficiently than ever before.

How important is it to force your brain to work hard? According to Dr. John Ratey of Harvard Medical School, and the author of *A User's Guide to the Brain*, using your brain keeps it vital and growing, and *not* using it leads to decay. Dr. Ratey concludes that, "for the first time, we are learning to see mental weaknesses as physical systems in need of training and practice."

Previous

Next

SEE OUR RESULTS

TRY BRAIN TRAINING FOR YOURSELF

MEET OUR EXPERTS

Home > Browse > Education > Educational Psychology > Learning Styles and Theories > Brain-Based Learning

Brain-Based Learning

1 Like 1 Tweet

Brain-based learning is also known as brain-compatible learning. It is the explicit acknowledgement that learning is fundamentally linked to the biological and chemical functioning of the brain. This may seem like a redundant concept but historically the role of the brain in the learning process has been overlooked. The revolution of education through brain-based learning is due to developments ...

Show more

Selected full-text books and articles on this topic at Questia

- The Brain-Compatible Classroom: Using What We Know about Learning to Improve Teaching**
Laura Erlauer. *Association for Supervision and Curriculum Development*, 2003 Read preview
- Research-Based Strategies to Ignite Student Learning: Insights from a Neurologist and Classroom Teacher**
Judith Willis. *Association for Supervision and Curriculum Development*, 2006 Read preview
- Brain-Based Learning: A Synthesis of Research**
Bellah, Kimberly A.; Robinson, J. Shane; Kaufman, Eric K.; Akers, Cindy; Haase-Wittler, Penny; Martindale, Lynn. *NACTA Journal*, Vol. 52, No. 2, June 2008 Read preview

Related topics at Questia

- Learning Theory
- Constructivism in Education
- Memory
- Memory Research
- Motivation
- Student Motivation
- Teaching Elementary School
- Teaching Middle School
- Teaching in High Schools
- Teaching in Colleges

Show all related topics

Ads by Google

Classroom Instruction
Instruct, Monitor and Control class computers. Free 40 PC eval copy. www.netsupportschool.com

Train To Become A Teacher
Study With The All-Get-Going-Dot-Com



My Learning Club

- HOME
- WHY US?
- TUTORING SERVICES
- TEST PREP SERVICES
- READING IMPROVEMENT
- MEET THE CLUB STAFF
- EXCLUSIVE CLUB PERKS
- CLUB ETHICS & RULES

E-MAIL US OR CALL (386) LEARNING (532-7646)



Tutoring and test prep made fun.
In-home reading and math tutoring for Deltona, DeBary, Orange City, DeLand, Lake Mary, Heathrow and Sanford areas. Serving Volusia and Seminole counties.

Home > Tutoring Services >

Learning Styles & Brain Preference

Experts have identified four unique learning styles — visual, auditory, tactile and kinesthetic, and two brain preferences — right and left hemisphere.

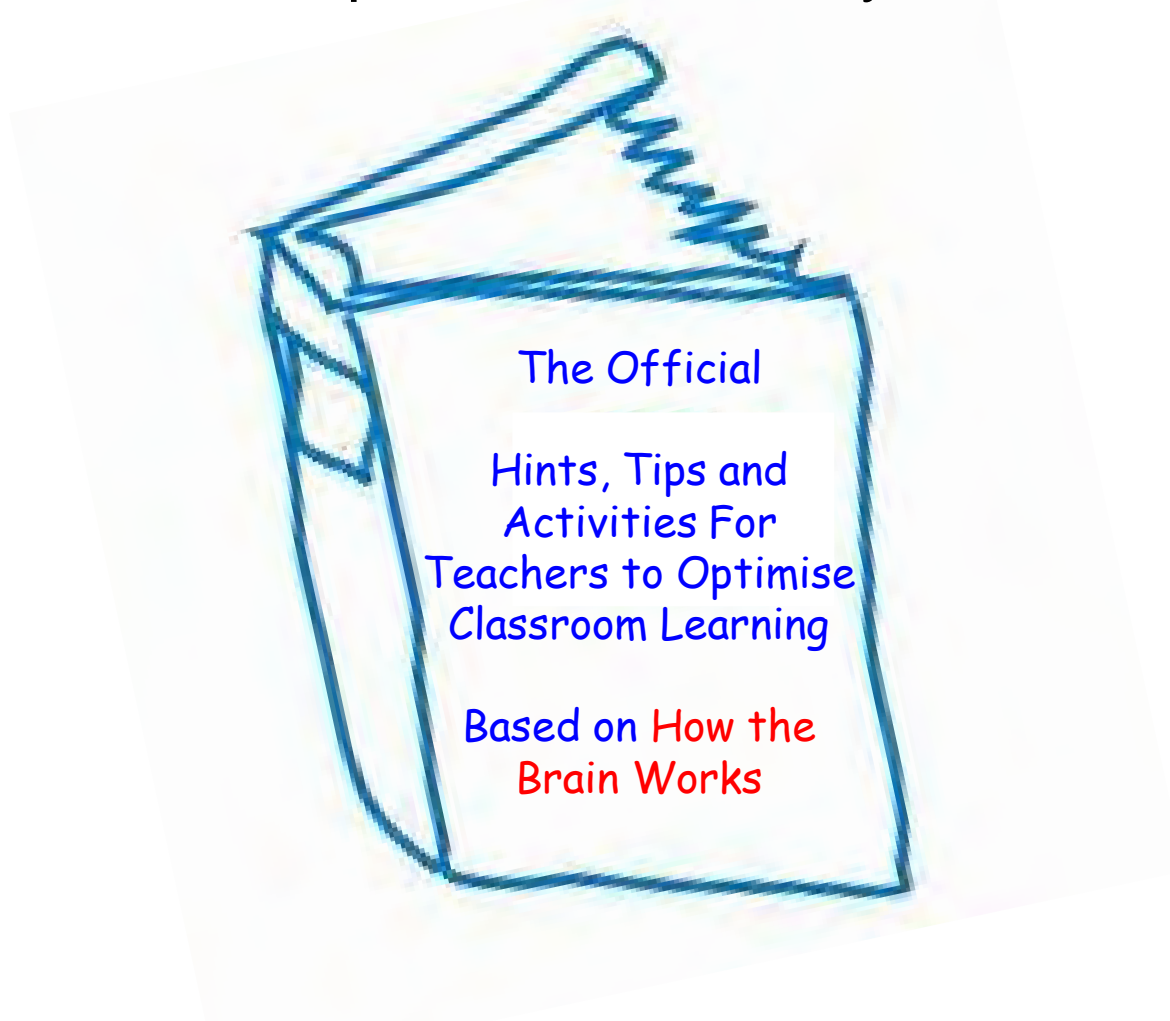
Learning Styles

Learning styles are how students receive information from the world, remember and understand it best.

My Learning Club has clearly identified each learning style and assigned it a fun, friendly mascot:

What do (some) teachers want?

- Some hints and tips on what actually works



Neuromyths



Nature Reviews Neuroscience | AOP, published online 12 April 2006; doi:10.1038/nrn1907

SCIENCE AND SOCIETY

Neuroscience and education: from research to practice?

Usha Goswami

Abstract | Cognitive neuroscience is making rapid strides in areas highly relevant to education. However, there is a gulf between current science and direct classroom applications. Most scientists would argue that filling the gulf is premature. Nevertheless, at present, teachers are at the receiving end of numerous 'brain-based learning' packages. Some of these contain alarming amounts of misinformation, yet such packages are being used in many schools. What, if anything, can neuroscientists do to help good neuroscience into education?

Results showed that on average, teachers believed 49% of the neuromyths, particularly myths related to commercialized educational programs

Front. Psychol., 18 October 2012 | doi: 10.3389/fpsyg.2012.00429

Neuromyths in education: Prevalence and predictors of misconceptions among teachers

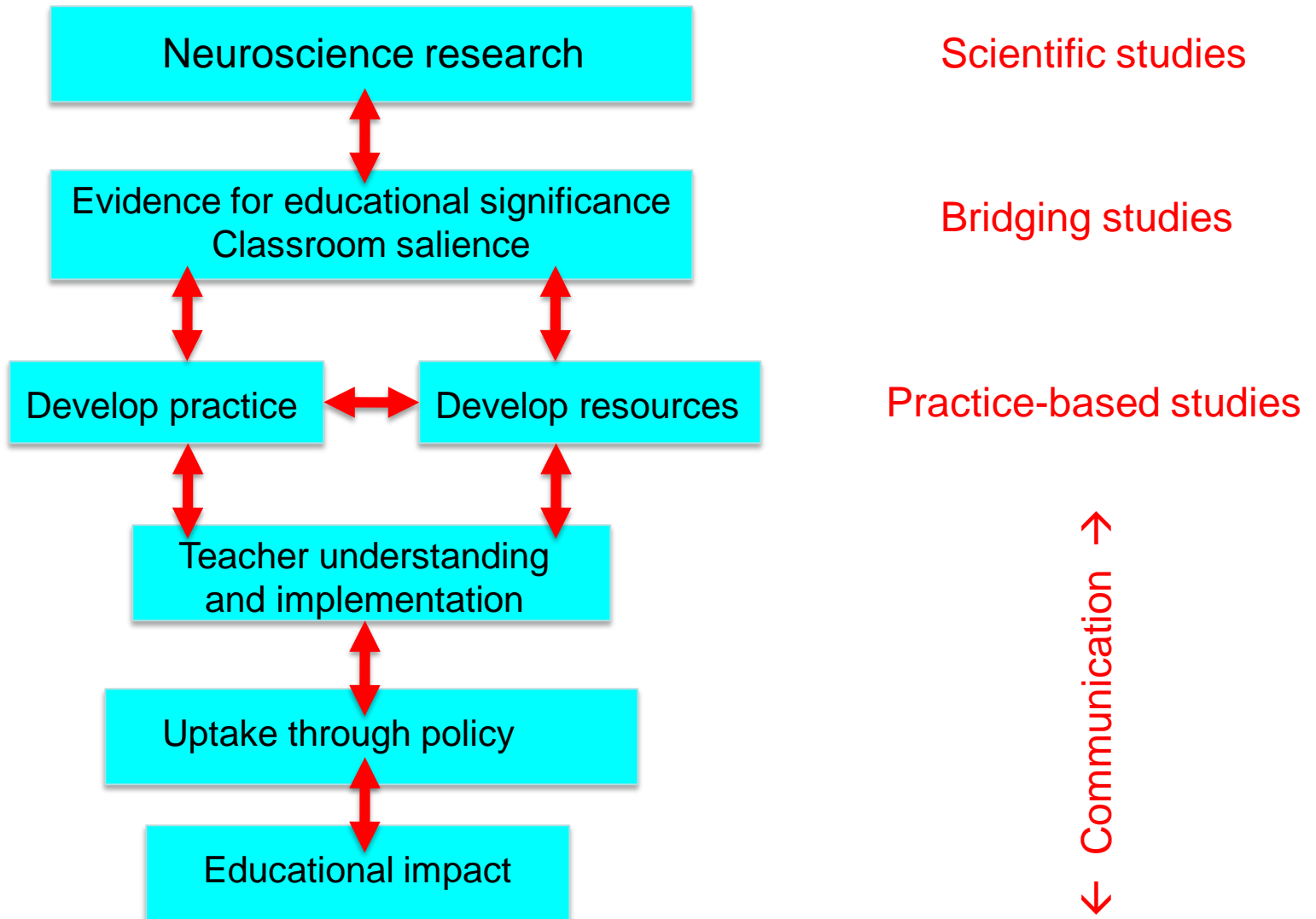
Sanne Dekker^{1*}, Nikki C. Lee¹, Paul Howard-Jones² and Jelle Jolles¹

¹ Department of Educational Neuroscience, Faculty of Psychology and Education, LEARN! Institute, VU University Amsterdam, Amsterdam, Netherlands

² Graduate School of Education, University of Bristol, Bristol, UK

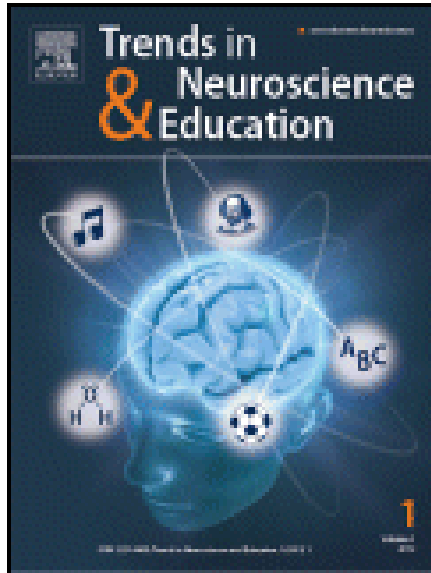
The OECD's Brain and Learning project (2002) emphasized that many misconceptions about the brain exist among professionals in the field of education. Though these so-called "neuromyths" are loosely based on scientific facts, they may have adverse effects on educational practice. The present study investigated the prevalence and predictors of neuromyths among teachers in selected regions in the United Kingdom and the

How neuroscience and education might interact – Paul Howard-Jones



What the future might hold

Mission statement of a new journal



- “200 years ago, **medicine** was little more than a mixture of bits of knowledge, fads and plain quackery without a basic grounding in a scientific understanding of the body
- In the middle of the nineteenth century, Hermann von Helmholtz, Ernst Wilhelm von Brücke, Emil Du Bois-Reymond and others drew up a scheme for what medicine should be (i.e., applied natural science)
- We believe that this can be taken as a model for what should happen in the field of **education**
- We believe that we know today more about the neuroscience of learning than Helmholtz et al. back then knew about the body”

Reasonable skepticism



- “You claim all learning is taking place in the brain. If that’s so, which type of preschool is best?”
 - A neuroscientist can’t answer this question
 - But answers will come from research in cognitive neuroscience

Biochemistry alone is not enough to cure a patient, and physics alone is not enough to build a bridge...

Neuroscience : Education

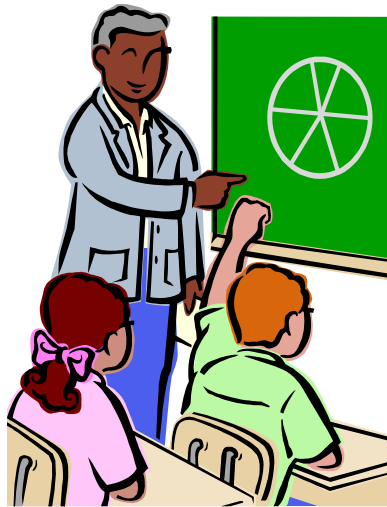
Biology : Medicine

Physics : Architecture

Predictions from the analogy to medicine



- Initial contribution of neuroscience will be to understand *why the educational methods that work do work* – only later: *and here's what else might work*



Predictions from the analogy to medicine



- Few magic bullet insights (penicillin, vaccination)
 - Instead an accumulation of small improvements that eventually add up to a revolution
 - Multiple small effects (risk factor model)



Working memory training . . .
Educational video games . . . Spaced
learning . . . Executive function
training . . . Reward-based learning . .
. Sleep to consolidate memories . . .
Diet . . . Aerobic exercise . . .
Meditation . . . Social networking

Predictions from the analogy to medicine



- The first findings to exert significant influence will be **broad** not **topic specific**
 - Factors bearing on brain plasticity, role of diet and exercise, role of sleep, hormones, emotions, vigilance and stress, social hierarchy effects...
 - The kinds of things that are general across species
 - Relevant findings from animal models or other primates (for whom education, per se, is not relevant)



More speculative outcomes



- Will there be a placebo effect in educational interventions?
 - This will make the evaluation of educational techniques much harder



The Hawthorne Effect

Wikipedia: The central idea behind the Hawthorne effect ... is that changes in participants' behavior during the course of a study may be "related only to the special social situation and social treatment they received."

More speculative outcomes



- Possible unpalatable conclusions from neuroscience
 - The better teachers do their job, the more different their students may become
 - Optimal teaching would require full genotyping of children
 - Interventions may have side effects
 - Not all aspects of children's abilities may be as manipulable as educators hope (e.g., motivation)



More speculative outcomes



- The main practical consequence of neuroscience on education will be on the training of future teachers

The screenshot shows the Department for Education Teaching Agency website. The main heading is "Postgraduate certificate in education (PGCE)". Below the heading is a photograph of a woman in a blue dress speaking to a group of people. To the right of the photo is a "Talk to us online" section with a "Start a conversation" button. Below that is a "New:" section with a link to "Physics with mathematics PGCE available – September 2012 start. Sign up". At the bottom of the page, there are several green buttons: "Sign up with the Teaching Agency", "Apply for teacher training", and "Speak to someone".

Department for Education | Teaching Agency

Menu **Get into teaching** A-Z of terms Using this site Contact us Accessibility

Premier Plus Teacher training options Funding for teacher training Teacher salaries School experience Events Subjects and age groups Life as a teacher Apply for teacher training

Home > Get into teaching > Teacher training options > University-based training > Postgraduate certificate in education (PGCE)

Search Get into teaching Go

Teacher training options

- University-based training
- Postgraduate certificate in education**
- Search for postgraduate courses
- Undergraduate ITT courses

Postgraduate certificate in education (PGCE)

Share Print



If you already have a degree, consider a postgraduate certificate in education (PGCE). A PGCE course mainly focuses on developing your teaching skills, and not on the subject you intend to teach. For this reason, you are expected to have a good understanding of your chosen subject(s) – usually to degree level – before you start training.

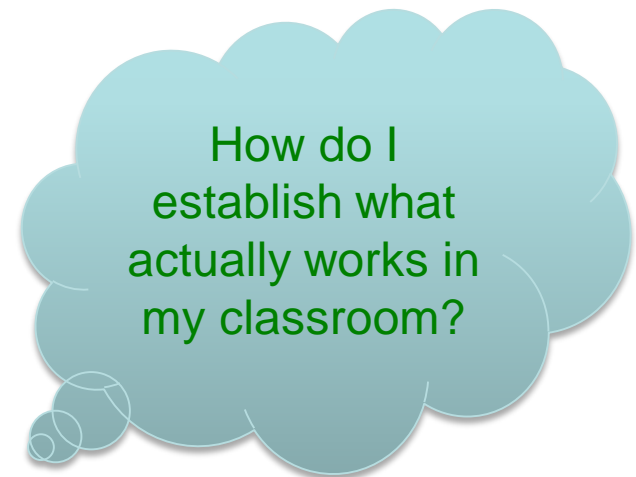
Talk to us online
Speak to a Teaching Line adviser live, between 8am and 6pm.
[Start a conversation](#)

New:
Physics with mathematics PGCE available – September 2012 start. [Sign up](#)

Sign up with the Teaching Agency
Receive tailored advice, information and find out about our new Premier Plus service.

Apply for teacher training
Apply online now for your chosen teacher training course.

Speak to someone



Analogies aren't perfect



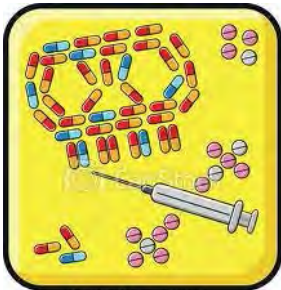
- Education is intrinsically a social, classroom-based phenomenon, compared to the dyadic phenomenon of the doctor-patient relationship



Analogies aren't perfect



- Ethical issues surrounding educational interventions may be more complex than those surrounding medicine
 - Drug treats disease
 - Education is a pathway out of poverty



© Can Stock Photo - csp8171376

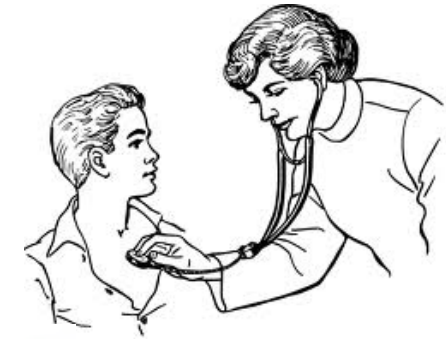


m©

Analogies aren't perfect




- Medicine is about the mind as well as the mechanisms of the body
 - Doctor-patient relationship
 - Attitudes to health (exercise, diet)
 - Role of the community



© Can Stock Photo - csp10639813

Attitudes to scientific input to practice

welcometrust  **Blog**

Life from a Wellcome Trust perspective [Home](#) [About us](#) [Terms and Conditions](#) [Science writing tips](#) [Focus on Stroke](#)

What can neuroscience teach education?

15 MAY, 2013

by Wellcome Trust tags: Education, Neuroscience, Science education

Do we really only use 10 per cent of our brain at any one time? And do we use one half of our brain more than the other? The answers are no and no, but that doesn't seem to stop these claims circulating. The Wellcome Trust's new education and neuroscience project seeks to banish these and other "neuromyths" and identify well-justified, evidence-based neuroscience interventions in educational settings, where and when appropriate. It's a very exciting project and there are a number of ways that you can play a part in shaping the future of education.

SEARCH

READ THINK, OUR BLOG ABOUT ART, SCIENCE AND THE BRAIN



GP doctor



VS

- Looks to science for new treatments
- Observes, listens, probes, diagnoses, prescribes...
- But doesn't lean over patients' shoulders as they take their pills
- Supported by nurses and health visitors



usethebrainsgodgiveyou PSYLLI LINK

16 May, 2013 2:47 pm

    Rate This

We already have politicians vying for educational funds at the expense of the children, and at the demoralization of teachers. All we need is eggheads who have the common sense of a flea destroying the educational system even more. Let's let teachers teach. Most have the heart for it.

[REPLY](#)

Workshop Discussion Topics

- Evaluating evidence: how do we know something works?
- Learning through life: does it change?
- Improving memory: how does training help?
- Impact of teaching: how does it affect the brain?
- Subliminal Learning: what role does it play?

Thanks for your attention

- Questions?