

WELCOME TO THE FIRST CICERO LEARNING SEMINAR ON LEARNING AND THE BRAIN

Over the past few years, science has made substantial advances in understanding the brain. Emerging knowledge of the brain is set to radically influence how we can understand and support learning in different settings. Furthermore, this new knowledge of the brain may have a significant impact on our thinking of educational practices in the future. What are the opportunities and issues that recent advances in neuroscience bring towards research and practice in learning and education and how should we approach them?

This symposium brings together experts and practitioners in neuroscience, learning and education to share, discuss and guide the development of a new interdisciplinary area. Namely, the symposium works as a platform for constructing multidisciplinary dialogue on (a) current research work in neuroscience and human development and how it intersects, contributes and challenges recent conceptions and practices of learning and education, (b) the ways in which theoretical perspectives embedded in neuroscience and human development may conjoin with and enrich contemporary theories of learning and teaching, and (c) identifying the means by which research capacity in this new and emerging interdisciplinary area can be further developed to address topics of interest for learning and education.

We hope that this CICERO Learning symposium will provide plenty of ideas for further collaboration. The symposium will be followed by a CICERO Learning conference in Helsinki on 20-21 November, 2007 where the themes from this symposium will be developed further. We hope that you will be able to join us also in November!

Welcome on behalf of the CICERO Learning network and the organizing committee:

Academy professor Risto Näätänen
Academy professor Mikko Sams
Professor Christina M. Krause
Professor Kristiina Kumpulainen
Dr Risto Hotulainen
Ms Helena Thuneberg
Ms Raija Latva-Karjanmaa
Ms Heidi Kivekäs

SYMPOSIUM ABSTRACTS

ADVENTURES ON THE ROAD FROM BRAIN SCAN TO LESSON PLAN: THE FOSTERING OF CREATIVITY IN DRAMA EDUCATION

Dr Paul Howard-Jones
The Graduate School of Education, University of Bristol

Moving from brain-based insights about learning to the design and implementation of new educational approaches is not straightforward and can be problematic. Various approaches are explored, with particular focus on an attempt by researchers and educators to co-construct an understanding that is both scientifically valid and educationally relevant. As well as identifying and reconstructing concepts about creativity, the project helped produce ways of communicating these concepts. The particular context is the fostering of creativity in drama education, but the approach can be applied in other curricula areas. The journey includes fMRI investigations, workshops with professional actors and extended work with student drama teachers.

The symposium is organised with the support of

HUMAN MEMORY AND LEARNING - NEURAL MECHANISMS

Professor Christina M. Krause
Department of Psychology, University of Helsinki

Cognitive processing, from stimulus perception and working memory to long-term memory requires the transient interaction between numerous, widely distributed interacting areas of the brain. Such wide-range integrative processes may be implemented by synchronization of neurons into transient oscillatory assemblies at different frequencies. Such brain oscillatory responses can be recorded concurrently while the subjects are engaged in cognitive processing, revealing cortical oscillatory dynamics during task execution.

Using a variety of cognitive tasks and stimuli, Krause and colleagues have published several reports on memory- and cognition-related brain oscillatory responses. This paper reviews recent findings on brain oscillatory responses witnessed during memory encoding and memory recognition. Additionally, the effects of stimulus modality, of the cognitive strategy of the subjects and of memory load on brain oscillations are discussed. Finally, the observations are summarized as to answer the question “what do we know about the neural mechanisms underlying learning?”

ATTENTION ASSESSMENT IN SCHOOL CONTEXT, A PILOT STUDY

Dr Risto Hotulainen
Helena Thuneberg
University of Helsinki

The purpose of this cross-disciplinary project is to have impact on educational quality, and to shake up the current school practices relating to the attention problems of the students. This project has close relevance to special pedagogy, educational psychology and neuropsychology, and methodologically to computational intelligence.

First aim of this project is to challenge the current ADHD-identification methods which solely apply behaviour observation lists (based on DSM-IV and ICD-10). Use of them is problematic because those criteria are strongly culturally and contextually bound, and do not per se reveal attention capacity of the students. Because of this shortage of objective tests, it is to be feared that ADHD is over-diagnosed, which might lead either to unnecessary medication, or to neglect of environmental factors causing attention problems, such as basic psychological needs deprivation. Thus, there is a clear need for an objective and a theoretically based tool which could reliably measure and either confirm or challenge results gained by attention observation. As a part of this project we aim to standardize the new Attention Concentration Test (ACT).

This test tool is thought to help in making the important distinction between ADHD having a neurological origin, and those secondary attention difficulties, which are merely products of poor person environment-fit causing child's maladjustment. Thus, by using ACT as a screening method we assume to find children who might benefit of further diagnostics and possible medical treatment, and on the other hand, those, whose attention difficulties are merely products of deficits in their environment, and could be supported by altering the conditions. Our second aim is to evaluate the fulfilment of the basic psychological needs, and support of autonomous self-regulation at school. Those we assess by using several measures based on the Self-Determination Theory.

Because our main field is special pedagogy, the most challenging task is to create theory and research-based intervention models. If we manage to find means to tap essential factors relating to ADHD, it is possible to plan better tailored interventions for different types of attention concentration problems, and accordingly, to fight against marginalization and drop-out from schooling.

The symposium is organised with the support of

THE BRAIN IN THE CLASSROOM: WHAT DO TEACHERS THINK ABOUT NEUROSCIENCE AND EDUCATION?

Dr Sue Pickering
The Graduate School of Education, University of Bristol

189 participants from the UK and overseas completed a questionnaire and 11 participants took part in semi-structured interview with the aim of understanding more about the views of educators on the role of neuroscience in education. Participants were asked about their views on the importance of an understanding of the workings of the brain in the design and delivery of educational programmes, sources of information on neuroscience and education, and ideas and initiatives that they had heard about or used in their educational institutions. They were also asked about challenges that might arise in the application of neuroscience to education. Findings from the study indicated a significant commitment to understanding more about the brain and to using knowledge from neuroscience in developing effective educational practice.