

Science of Learning

Convergence of educational,
developmental cognitive
neuroscience and artificial
intelligence perspectives



WHEN? 2-3 SEPTEMBER 2018
WHERE? MPI BERLIN, GERMANY



Max-Planck-Institut für Bildungsforschung
Max Planck Institute for Human Development



CENTER ON THE
DEVELOPING
ADOLESCENT

Freie Universität



Berlin



JACOBS
FOUNDATION

EDUCATIONAL, DEVELOPMENTAL COGNITIVE NEUROSCIENCE AND ARTIFICIAL INTELLIGENCE PERSPECTIVES ON LEARNING

The application of computational and neuroscience approaches in developmental science is leading to new insights into the cognitive and neurobiological mechanisms underlying developmental changes in learning. However, it is yet unclear what the possible consequences and applications of these new discoveries are for educational settings. At the same time, increased use of electronic learning materials has sparked a big data revolution in education. The emerging field of educational analytics aims to use this high-fidelity data in order to better understand and facilitate learning. Yet, there are only very few examples where analytics are informed by cognitive models of learning. The aim of this symposium is to move towards a more complementary, integrative view on how learning mechanisms change across development and what the impact of these developmental changes could be for the design of learning interventions and environments.

The aim of this symposium is to lay out the different perspectives on science of learning research in education and developmental cognitive neuroscience and to crystalize challenges and gaps in both fields where an interdisciplinary exchange would be helpful. To constrain the discussion and to maximize the potential of finding specific overlap we have selected three topics: (1) developmental changes in cognitive and motivational processes underlying learning, (2) the social context of learning, and (3) how big data may inform cognitive models of learning.

In the Sunday morning session, we will focus on methodological problems that constrain the translation of findings from basic science to the classroom, and on promising new avenues of quantitative research using electronic learning materials and artificial intelligence. For example, one way to build bridges between the laboratory and the applied context could be to make advantage of the increasing use of electronic learning materials in the classroom.

In the Sunday afternoon session, we will ask participants to form small interdisciplinary groups focusing on one of the three focal topics. The aim of these groups is to identify gaps in both fields that can be filled by an interdisciplinary exchange. The anticipated outcome of these working groups would be a project outline for collaborative research addressing the respective topic. On Monday morning, the groups will reconvene and present the project outlines. The presentations will be followed up by a moderated discussion of overall outcomes of the symposium.

To foster the cross-disciplinary debates we aim to have roughly equal amounts of participants from the educational sciences, analytics/artificial intelligence, and developmental cognitive neuroscience.

Organizing committee: Julia Rodriguez Buritica (FU Berlin); Dietsje Jolles (Leiden University, UCLA); Ben Eppinger (Concordia University, TU Dresden) & Wouter van den Bos (University of Amsterdam, MPI Berlin)

PROGRAM

DAY 1 Sunday, September 2nd

MORNING

What do we know & what are the most important outstanding questions? What are most fruitful avenues for cross-discipline collaboration?

10-13 am **Presentations**

5 Talks with perspectives from different fields (Prof. Sylvia Bunge, Prof. Haan van der Maas, Prof. Martijn Meeter, Dr. Julia Rodriguez Buritica, NN)

13-14 pm **Working Lunch**

Small group discussions connecting morning presentations to individual projects

AFTERNOON

Mind the gap! Exchange between educational and developmental cognitive neuroscience perspectives on learning

The aim of the afternoon session is to identify gaps in both fields that can be fulfilled by an interdisciplinary exchange.

14-17 pm **Interdisciplinary group discussions**

- 1) Cognitive Development and Optimal Learning Strategies
- 2) The Social Context of Learning
- 3) Bridging Laboratory and School: Big Data & Cognitive Models

18 pm **Dinner**

DAY 2 Monday, September 3rd

MORNING

Fill the gap! Results of exchange between educational and developmental cognitive neuroscience perspectives on learning

The aim of the morning session is to report and discuss the results of the small group focused discussions.

9-10 am **Presentation group discussions**

10-11 am **Presentations: Neuroscience and Education** (Prof. Paul Howard-Jones, Prof. Elsbeth Stern)

11-12 am **Moderated discussion**

12-1 pm **Lunch**

Confirmed Speakers

Prof. Han van der Maas

University of Amsterdam, Department of Psychological
Methods (co-founder oefenweb.nl)

Prof. Silvia Bunge

University of California Berkeley, Department of Psychology

Prof. Bruce McCandliss

Stanford University, Graduate School of Education

Prof. Martijn Meeter

Vrije Universiteit Amsterdam, LEARN! Research Institute and
Amsterdam Center for Learning Analytics

Prof. Paul Howard-Jones

University of Bristol, School of Education & Department of
Neuroscience

Prof. Elsbeth Stern

ETH Zurich, Institute of Behavioral Sciences

Dr. Julia M. Rodriguez Buritica

Freie Universität Berlin & Center for Cognitive Neuroscience
Berlin

ACCOMMODATION/TRAVEL EXPENSES

The meeting will take place at the MPI Berlin (Lentzeallee 94, 14195 Berlin). <https://www.mpib-berlin.mpg.de/en>. We would like to ask all participants to start booking tickets and hotel rooms. We will reimburse economy-class tickets and accommodation up to 150 € per individual participant after the conference.

Here we suggest some hotels near the MPI (we cannot guarantee their availability):

Hotel Seminaris

Double room comfort: 110,00 €
Double room standard: 100,00 €
berlin@seminaris.de

Hotel Novum Ravenna

Single room: 119,00 €, breakfast included
Double room standard: 127,50 €
ravenna@novum-hotels.com

This is more central:

Metropolitan Hotel Berlin

Single room: 118 €
Double room standard: 124,08 €
info@metropolitanberlin.com

Albergo City Hotel Berlin

Double room standard: 113,05 €, breakfast included
info@albergo-city-hotel.de