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


Neurotechnology in the classroom: Current research and future potential

Neurotecnología en el aula: investigación actual y futuro potencial

Thematic Editors

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Scope

Innovative and emerging neurotechnologies provide new opportunities for educational research in cognitively diverse environments to examine learning mechanisms, processes and interactions within natural contexts. Portable eye-tracking technology, mobile or wearable EEG, EDA, BCIE, fNIRS or stimulation headsets are some of the neurotechnologies utilized that are paving the way towards an understanding of the learning brain within ecologically valid contexts. As a result, studies in classrooms settings are emerging for multiple purposes of processing and analysing data from devices, from both teachers and students, to provide personalized data, feedback or awareness on concentration, attentional focus, memory retention, inter-brain activity and effects of different teaching methodologies, among others. This Special Issue focuses on these recent studies and the implications of real-time brain data for observation and stimulation, along with the limitations related to ethical and ecological validity, to ponder their practicality and to envision responsible approaches to classroom research and innovation.

Descriptors

- Post-digital challenges and innovations using neurotechnologies in education.
- Studies using neural data for scanning or collecting data on learning mechanisms.
- Studies for the stimulation, feedback or modification of neural responses.
- Studies of brain synchrony, hyper-scanning or social interactions.
- Studies addressing neurodiverse learner needs or preferences.
- Studies in vulnerable educational contexts or low-income countries using neurotechnologies.
- Transdisciplinary studies combining neurotechnologies and Learning Analytics, Artificial Intelligence, or Machine Learning.
- Ethical implications and responsible integration of neurotechnologies in the classroom.
- Development and application of low-cost portable devices for the brain observation or stimulation.

Questions

- What are the potential affordances and opportunities of using neurotechnologies within a classroom?
- How are neurotechnologies used within current existing classroom research?
- What neuro-mechanisms are being studied and which remain underexplored?
- Can non-invasive brain measures in educational contexts inform learning personalization practices?
- To what extent can current results be generalised and inform pedagogical interventions?
- What are the issues and limitations regarding the real-classroom naturalistic context of investigation and use of neurotechnologies?
- Do neurotechnologies present new ethical challenges for the pursuit of cognitive enhancement, such as exaggerating achievement gaps?
- Are there new ethical issues in the safeguarding and manipulation of neural data security?
- What are the implications of the educational research with neurotechnologies for informing educational theory, practice and policy?

Editors

Michael S. C. Thomas (Birkbeck University of London, United Kingdom)

Professor of Cognitive Neuroscience, Director of University of London Centre for Educational Neuroscience, Associate Editor for the journal *Mind Brain and Education*. Co-author of the recent book *Educational Neuroscience: Development Across the Life Span* (Routledge). His research focuses on a multidisciplinary approach to understanding cognitive variability, including educational, psychological, neuroscience, genetic, and computational approaches. His research has been published in high quality peer-reviewed journals including *Nature*, *Psychological Review*, *Developmental Science*, and *Behavioral and Brain Sciences*.

Jo Van Herwegen (University College London Institute of Education, United Kingdom)

Associate Professor of Developmental Psychology and Education. Director of the Child Development and Learning Difficulties lab at Institute of Education. Associate Editor for the journal *Research in Developmental Disorders*. Co-editor of a book on *Neurodevelopmental disorders: Research challenges and solutions* (2014) and *Practical research with children* (2016). Her research focuses on improving educational outcomes for children with learning difficulties using evidence from developmental psychology, linguistics, and educational neuroscience. Her research has been published in *Mind Brain and Education*, *Developmental Science*, *Journal for Autism and Developmental Disorders* and has co-edited a Special Issue on Neurodevelopmental disorders in the classroom (2019).

María José Hernández-Serrano (University of Salamanca, Spain)

Tenured lecturer in the Department of Theory and History of Education, in the area of Educational Theory. Editor of the book on *Emerging skills in Teacher Education* (2021). She has written extensively on the educational processes mediated by digital technologies and the evolution of the digital competences for teachers and students. Her research interest is on the transdisciplinary application of brain-based research to educational contexts and virtual environments, and the neuropedagogical implications of the technologies on the development of the brain in younger students.

Guidelines for authors and submission

Editorial Guidelines:

<https://bit.ly/3m5GDoq>

Contributions for the Special Issue should be submitted through the OJS platform:

<https://bit.ly/2Rhs96l>

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