The architect's brain revisited : how neuroscience can inform architectural education

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The turn of the previous decade saw a surge in publications on the potential of neuroscience in learning and cognition. The work of authors like J. Zull (2002), M.S.C. Thomas (2011) and D.S. Busso (and Pollack, 2013) to mention but a few researchers in neuroeducation, introduced to educators how specific findings from neuroscience can inform education practices. Around the same time, H. F. Mallgrave (Mallgrave, 2011) presented a ground-breaking view of the history of architecture through the lens of the architects' brain capabilities: the various architectural eras were presented as the result of architects' brains responding to their sociocultural context.

This paper revisits the findings on neuroeducation and the observations on the architects' brain to present two ways that neuroscience can inform architectural education:

The first part presents how existing neuroeducation findings can be applied in the specificity of architectural education. The process of architectural training has been well documented as being different to typical ways of learning, involving a reflective practice that happens through the interaction with objects (Schön, 1984). Because the cognitive process is different, I review research from neuroeducation to understand how it applies to the architectural "learning by doing" process.

I then move on to present what the ongoing turn of architecture to digital objects holds for the future of the built environment in the second part of the paper. Using examples from the architectural studio, I describe how designing something through a physical vs a digital model produces a different effect. Work samples of two cohorts running in parallel are presented: the first one was asked to design solely through manual methods of model making and the second one exclusively through a digital model. I conclude this section by arguing that digital model making in architecture offers not simply a different learning technique to an architecture student, but it involves an entire cognitive change in the student's spatial perception.

I conclude the paper by arguing that the move of architectural education into the digital domain has the potential to transform the future architect's brain. We are about to witness a change in the built environment and consequently the cities of the future as a result of the changing architects' education.

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Short Bio

Dr. Athena Moustaka is an engineer, architect, and early-career researcher in architectural theory and architectural education. She has been a full-time faculty member (Lecturer in Architectural Design) at the University of Salford, Manchester, since 2015. She is currently the Programme Director for BSc Architectural Engineering and a member of Salford's Centre for Urban Processes, Resilient Infrastructures & Sustainable Built Environments research group. As an expert in digital Architecture, Athena teaches an array of BIM Design studio modules. Over the 5 years at the university, she has taught across all levels and many of the students that have studied with her are now pursuing their own successful careers in BIM related positions across the UK and Internationally. Athena is a reviewer for top quartile architectural theory publications (Building and Environment, Architectural Research Quarterly, arq). She has delivered talks to multiple international conferences and chaired relevant sessions in her field. She has also been a Visiting Scholar at San Diego State University, and Northeastern University, as part of Marie-Curie MAPS LED project (RISE researcher, funded under H2020) Athena has published papers in journals and conference

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