Cultivating a culture for Neuro-Architecture
Linking cognitive science to architectural experience in design education

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Can Cognitive Science inform Architectural Practice and Theory? How might advancements in neuroscience provide a link to understanding the human experience of the built environment?

These questions serve as the basis for a Neuroscience and Architecture graduate seminar where architecture, planning, and landscape students explore the symbiotic relationship between neuroscience and design thinking. This relationship operates far beyond the classroom, as the empirical data and theoretical frameworks that emerge from the research intersects the future public spaces we create. This paper will explore how advancements in neuroscience provide a link to understanding the human experience of the built environment.

The paper will introduce a cognitive model for integrating neuroscience into architecture education, and will present a case study of a student project that explores the relationship between neuroscience and architectural design.

Learning Outcomes

1. Understand the basic principles of neuroscience and how they relate to urban and architectural design.
2. Develop a cognitive model for integrating neuroscience into architecture education.
3. Apply the cognitive model to a case study of a student project.

B = f (I, E) Life: function of the individual and the environment.

Evidence-based design
Claims are knowledge-demanding research, and research is adding value to the design of their capital assets. Evidence-based protocols originated in medicine in the 1980s and were expanded to the architecture realm by medical healthcare designers requiring that certain features be supported by the design of a building. The protocols hinge on the notion that buildings are the environments for education, working, and aging. Therefore, there exists a need to research evidence-based design on health in buildings.

A Call to Action
A protocol-based design needs to be developed in order to begin to pursue future designers to consider this in their work. The architectural profession can no longer ignore these advances as the design professional needs not only to understand the concept but also to implement it.

Why Neuroscience?

How does neuroscience inform evidence-based design? Levon’s equation, B = f(I, E), describes behavior as “a function of the individual and the environment” such that the behavior will not remain the same. Therefore, the environment needs to be designed in a way that supports the individual, whether it be a social or physical condition, or in its context. Assessing the individual (F=1 of the equation) is critical to understanding behavior, because perception and sensation govern and inform, and are themselves mediated by the environment (E). Therefore, an environment that is more conducive to the well-being of the individual will lead to a better quality of life. Neuroscience can provide a vehicle to studying the dialogue between the human experience and the designed environment.

The paper will introduce a cognitive model for integrating neuroscience into architecture education, and will present a case study of a student project that explores the relationship between neuroscience and architectural design. This relationship operates far beyond the classroom, as the empirical data and theoretical frameworks that emerge from the research intersects the future public spaces we create. This paper will explore how advancements in neuroscience provide a link to understanding the human experience of the built environment.

Every significant experience of architecture is multi-sensory; qualities of matter, space and scale are measured equally by the eye, ear, nose, skin, tongue, skeleton and muscle.

-Juhani Pallasmaa [3]

References


Course Content

Learning Outcomes: Understand environment-based human needs and interactions using knowledge from the neurosciences.

Experiential learning and case study activities supplement lecture content to help students test and explore relationships between neuroscience and design.

Course Objectives:

1. To understand how human needs and behavior are influenced by the built environment.
2. To develop an understanding of the interplay between the brain and the built environment.
3. To apply knowledge of the brain and built environment to design.

Learning Activities:

1. Field trips and site visits to see how neuroscience principles are applied in real-world design.
2. Case studies and research on how neuroscience influences architectural design.
3. Collaborative design projects that incorporate neuroscience principles.

Assessment:

1. Participation in class discussions and group activities.
2. Written assignments that demonstrate understanding of neuroscience principles and their application to design.
3. Final design project that incorporates neuroscience principles into a coherent design solution.

Grading:

1. Participation (30%)
2. Assignments (30%)
3. Project (40%)