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PRESENTER ABSTRACTS

ACADEMY OF NEUROSCIENCE FOR ARCHITECTURE

Diffusion Of Innovation: Neuroscience & Architecture From Pedagogy To Practice

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Introducing instructional strategies for linking neuroscience and architecture resulted in willingness by students in several postsecondary architecture programs to consider these principles in their own work. Post-course discussions and surveys indicated that learning in the context of a neuro-architectural conceptual framework and using universal design objectives offered opportunities for students to think and create their designs in a more comprehensive way that incorporated sensory processing, space perception, and cognition. Using the diffusion of innovation as a model to examine how individuals and organizations begin to practice in new ways, offers a lens for examining change and building a community of practice.

1. EXTENDED ABSTRACT

1.1. Background

The intersection of neuroscience and architecture offers to build a community of practice who support, encourage and teach each other to use rigorous research from neuroscience, informing design innovations for the benefit of all. Individuals and organizations make the choice to adopt an innovation based on their perception of the merits of the innovation itself, communication, time, cost, risk or limitations, and the social system (Cheng, Kao, & Lin, 2004). We looked at a process that includes innovation, teaching, and adoption as a change phenomenon, exploring those qualities most likely to successfully spread the use of neuroscience and architecture in professional practice, research and pedagogy. Neuroscientific principles relating to sensory processing, space perception, and cognition are applied to design projects for learning and health in clinical populations including those with autism, multiple sclerosis, and sensory or learning disorders.

1.2. Pedagogic Protocols

Pedagogic studies in design studios and architecture, planning, or landscape lecture courses at four universities or colleges, and the Berkeley Prize study incorporated a pragmatic approach that integrated neuroscience and 'research-based design'. A practice-based protocol for critical analysis and translation of rigorous findings into human-centered design principles merged disciplinary frameworks (Edelstein, 2013). Examples include analysis of clinical and physiological studies of the environmental responses of people with multiple sclerosis, autism, and those with specific hearing, ambulatory, visual, or learning needs (Edelstein & Sax, 2013).

1.3. Survey Findings

Surveys and discussion groups revealed how student attitudes changed as a result of the pedagogical strategies. A post-course survey was completed by the Berkeley Prize 'neuro-universal' studio by 17% (11 of 63) of the students. Using a 5-point scale (Strongly agree = 1; Agree = 2; Neither Agree or Disagree = 3; Disagree = 4; Strongly Disagree = 5), eight questions probed how students thought about design, and how the experience of the class influenced their thinking. Ninety percent (n=10) of the students strongly agreed or agreed that "These experiences made me think about designing for people with a broad range of abilities." Seventy-two percent (n=8) strongly agreed or agreed that "These experiences made me think about how my senses, movement, emotion, and thinking change with design." Eighty percent (n=8) strongly agreed or agreed that "These experiences influenced the design of my studio projects." Ninety percent (n=9) strongly agreed or agreed that "These experiences will influence how I design in the future. Students revealed the positive impact of the neuro-architectural conceptual framework, and universal design objectives in their responses to open questions: "I had a much broader range of considerations after these experiences; I began thinking about all the senses and not just physical mobility or blindness." Another student commented "UD is no longer an afterthought… the goal is now imbedded into initial sketches… before any hard lines are drawn."

1.4. Conclusions

We examined this approach in the context of a strategy for change, exploring qualities most likely to make innovation spread successfully. Professional adoption of a 'neuro-architectural' approach is discussed, based upon efforts to change the 'design product or process' rather than 'persuading individuals' to change. Strategies for the adoption of such principles in accredited architectural courses and professional practice is considered in the context of the United States, Canada, China, and Ireland. The importance of peer-to-peer conversations, networking, and iterative interaction among architecture students, educators, and individuals with disabilities are explored. In undertaking an approach that yields a diffusion of innovations, "it is not people who change, but the innovations themselves" (Robinson, 2009).

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2. REFERENCES

Cheng J, Kao L, & Lin J. (2004). An investigation of the diffusion of online games in Taiwan: An application of Roger's diffusion of innovation theory. Journal of American Academy of Business, 5(1/2), 439-445.

Edelstein, Eve A. (2013, October). Research-based design: New approaches to the creation of healthy environments. World Health Design Journal, 62-67.

Edelstein, E., & Sax, C. (2013, February). Expanding the universe of design. 28th Annual International Technology and Persons with Disabilities Conference, San Diego, CA.

Robinson, L. (2009). A summary of diffusion of innovations. [Internet] [cited 2013 Jan 25]. Available from: www.enablingchange.com.au/Summary_Diffusion_Theory.pdf

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Dr. Edelstein is a Teaching Fellow for the 2013 Berkeley Prize in Universal Design. She holds degrees in Anthropology (UC Berkeley), Architecture (NewSchool of Architecture & Design) and Neurophysiology (University London), and conducted clinical research at the National Hospital for Neurology & Neurosurgery, London UK, the Harvard/MIT Hearing Lab, the US Naval Medical Center, and California Health Services. Her work as Senior Vice President, HMC Architects, President of Innovative Design Science and Principal Investigator, 2005 Latrobe Prize, informed built projects for the Canadian Ministry for Health, University of California San Diego, and a 2.4 million square foot hospital in China, winner of an AIA AAH International Award. At UC San Diego, her research yielded novel intellectual property for eye-tracking, and real-time sound and visual CAVE simulations focused on medical error. At UA, Dr. Edelstein is developing professional / degree programs and cross-disciplinary courses in neuro-architecture and healthy design for architecture, landscape architecture, planning AND real-estate development.

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