# Researchers use virtual reality to demonstrate effectiveness of 3D visualization as a learning tool

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Researchers from the Neuroimaging Center at NYU Abu Dhabi (NYUAD) and Wisconsin Institute for the Discovery at University

Wisconsin-Madison have developed the *UW Virtual Brain Project*, producing unique, interactive, 3D narrated diagrams to help students learn about the structure and function of perceptual systems in the human brain. A new study exploring how students responded to these lessons on desktop PCs and in virtual reality (VR) offers new insights into the benefits of VR as an educational tool.

Led by Associate Professor and Director of NYUAD's Neuroimaging Center Bas Rokers and Assistant Professor of Psychology and a Principal Investigator in the Virtual Environments Group at the Wisconsin Institute for Discovery at University of Wisconsin-Madison Karen Schloss, the researchers have published the findings of their work in a new paper, "UW Virtual Brain Project: An immersive approach to teaching functional neuroanatomy" in the journal *Translational Issues in Psychological Science* from the American Psychological Association (APA). In their experiments, the researchers found that participants showed significant content-based learning for both devices, with no significant differences between PC and VR devices for content-based learning outcomes. However, VR far exceeded PC viewing for achieving experience-based learning outcomes—VR was, in other words, more enjoyable and easier to use.

"Students are enthusiastic about learning in VR," said Rokers. "However, our findings indicate that learners can have similar access to learning about functional neuroanatomy through multiple platforms, which means that those who don't have access to VR technology are not at an inherent disadvantage. The power of VR is its ability to transport learners to new environments they might not otherwise be able to explore. But, importantly, VR is not a substitute for real-world interactions with peers and instructors."

The 3D narrated videos are already in active use at classes that include neuro-anatomy instruction both at the University of Wisconsin-Madison

and at NYUAD.

See the team's Illustration of the Visual Pathway Demo in the Virtual Brain Project video:

The team's perspective on VR education is that VR is a lens, analogous to a microscope or telescope, through which students experience content that would otherwise be difficult to see. They believe that the future of VR in the classroom is to provide enriched experiences that are integrated within the larger course structure, rather than supplant traditional education. Just as students do not spend entire classes with microscopes or telescopes attached to their face, they also need not to spend entire classes wearing VR headsets. VR acts as a springboard to facilitate class discussion and activities, rather than isolate students from each other and the instructor. Thus, the UW Virtual Brain Project lessons are brief (about 5 minutes) and can be built into regular lessons on neural structure and function.

**More information:** Karen B. Schloss et al, The UW Virtual Brain Project: An immersive approach to teaching functional neuroanatomy., *Translational Issues in Psychological Science* (2021). DOI: 10.1037/tps0000281

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