

Brain science—building a framework for ethical and social aspects

November 18 2016

Repairing traumatic brain injury, staving off dementia, improving memory, regulating emotion, controlling devices with mere thoughts, plus a multitude of other means of interacting with or influencing fundamental brain functions are here or will be soon.

A breathtaking array of new technologies to diagnose, treat or influence human brains have been landing on society's doorstep—with no signs of slowing. Yet regulations and accepted practices guide the development and use of neurotechnology, especially those relating to broader societal issues, appear to be rudimentary in comparison.

The flood of emerging brain technologies is raising ethical, social and legal questions: Who has access? Who has control? Who benefits? And who doesn't? What are the potential risks and costs?

As diagnostic, treatment and enhancement technologies with potential to alter the way we perceive and interact with our environment pour in from diverse sources, there is a struggle for policy to keep pace with rapid advancements. A group of key stakeholders are seeking to draw from sundry efforts dealing with these issues and establish guidance materials that proactively address concerns around neurotechnologies, and steer research and development activities toward positive outcomes.

Arizona State University collaborated with the Organization for Economic Co-operation and Development (OECD), and the National Academies of Sciences, Engineering and Medicine to convene a 1.5 day

workshop in September that specifically focused on the ethical, legal and [social issues](#) related to swiftly developing fields of neuroscience and research into the human brain.

"The goal was to bring together a diverse set of actors, from across the globe, in order to identify key areas of research activities, and then consider how broader ethical, legal and social issues can be brought into the research agenda at an early stage in the technology's development. In doing so, we hope to identify, and develop, core approaches and [guidance materials](#) that can help ensure that developments which affect brain function and treat disease are not only safe and effective, but also are in the best interest of patients and society more generally," said Diana Bowman of ASU's School for the Future of Innovation in Society (SFIS) and Sandra Day O'Connor College of Law and co-author of a recent article reporting on the workshop's accomplishments.

The article, "Neurotechnology and Society: Strengthening Responsible Innovation in Brain Science" published in the journal *Neuron* emphasized the need for having discussions "now, rather than waiting until the technology has been proven to be safe and effective for therapeutic applications."

Drawing from the experience of previous initiatives in areas such as genomics and nanotechnology, the workshop participants, representing a broad array of backgrounds and disciplines, produced a series of key points for use in formulating policy, designing best practices and frameworks for integrating [brain science](#) and society.

Included in the discussion was the director of SFIS, David Guston, whose work in "anticipatory governance" points to the need for considering social values and managing ethical inputs during early development stages of advancements rather than waiting until technologies are entering markets. The article describes this as an

approach that "combines techniques for anticipation, the development of realistic scenarios and public engagement to help inform policy and the development of an appropriate governance framework." But it also notes that costs and political risks are associated with meaningful public engagement.

The article summarized five "key policy implications emanating from the OECD Workshop" and called for increases in transparency, collaboration, mechanisms to enable [responsible innovation](#) and participation on a global scale to reflect broad social needs and values in the creation of guidelines and evidentiary standards.

Provided by Arizona State University

Citation: Brain science—building a framework for ethical and social aspects (2016, November 18) retrieved 23 April 2024 from <https://medicalxpress.com/news/2016-11-brain-sciencebuilding-framework-ethical-social.html>

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