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Diversity and Democracy

Science Education and the Big Global Questions: Learning with a Purpose

By: [Kathryn Peltier Campbell](#)

Among physics students, scientists, and historians, the anecdote is well known. J. Robert Oppenheimer, observing the first nuclear explosion at Trinity—named, he claimed, in obscure reference to the poems of John Donne—recalled these lines from the Bhagavad Gita: "I am become Death, the destroyer of worlds." Positioning this momentous scientific breakthrough within eastern and western canons, at the crux of poetry and religion, Oppenheimer traced the global arc of a technology that would have a truly global impact. Clearly, he knew the potential for consequences that were far from benign.

What is less clear is the effect Oppenheimer's echoing observation has had within physics classrooms, and in scientific teaching and learning more generally. His words beg the question of whether he foresaw the devastation his work would wreak halfway around the world. Did the complex ethical implications weigh heavily on him? To what purpose did he toil in creating new technologies—and to what end, more generally, does science advance? These are weighty and relevant queries, but within introductory science courses, they seem to receive little attention compared to the technical aspects of atomic energy.

Conversely, students who pursue these questions beyond the scientific disciplines may engage deeply with technology's potential impacts. But without basic literacy in the sciences, they cannot truly grapple with the choices that technology presents. Without basic understanding of the science of nuclear energy, for example, one cannot evaluate its risks and benefits to people and to the environment, in local and global contexts. What will the future look like if its leaders—today's college students—cannot make educated decisions about these topics?

If students currently spend more time exploring how science works than why we pursue it—or more time critiquing scientists' decisions than understanding the knowledge underlying them—one has to wonder what would happen if those priorities were more balanced. What if students more often studied science using the big global questions—of ethics, meaning, and human

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interconnectivity—as a framework for the nitty-gritty details of technical analysis? And what if they approached the philosophical questions of meaning and purpose with a deeper understanding of science?

This issue of *Diversity & Democracy* broaches these questions by exploring scientific pedagogies that are grounded in the twenty-first century's big global questions. Seeing interdisciplinary subjects like environmental sustainability and global public health as scaffolding for science teaching, it points to pedagogical models that allow students to develop scientific literacy paired with an understanding of global and ethical contexts, whatever their future majors or careers. An expansive understanding of science *and* its implications is necessary if higher education is to responsibly mobilize science's potential. We invite readers to consider our authors' efforts to teach science with purpose, clarity, and context, and to consider the implications for teaching and learning at their institutions.

Kathryn Peltier Campbell is editor of *Diversity & Democracy*.

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