ASU researcher explores responsible innovation

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An engineer works in the lab on a promising research project. He follows all the rules, works with the materials available to him and produces quality work. He never lies, cheats or steals. His research eventually results in a new technological innovation. Everybody wins.

But five or 10 years down the road, a byproduct of that new technology proves to be harmful to the environment. What if this unintended consequence could have been easily avoided had the engineer made a simple change in his research process?

While it may be difficult to foresee, the work of scientists and engineers often has a societal impact. Arizona State University professor Erik Fisher is interested in helping them think about these impacts before it's too late.

Fisher leads a project called Socio-Technical Integration Research (STIR), which includes studies of 30 labs in three different countries to see how responsible innovation can best be achieved. He presented his research today (February 15) at the annual meeting of the American Association for the Advancement of Science in Chicago.

While "socio-technical integration" is a new way of doing science that may take some getting used to, it could make a big difference for the impact of future research on society. There are consequences for failing to take humanistic concerns into consideration.

"We can make research funding decisions that aren't socially equitable," Fisher said. "We can set up projects and programs that have promises that are too good to be true."

Fisher's research focuses on responsible innovation – a relatively new policy concept that came to life when the U.S. government began funding nanotechnology.

Responsible innovation considers the humanistic and even philosophical aspects of new research without having to compromise progress or scientific integrity. Natural scientists haven't generally done this because of the nature of the field.

How can we ensure responsible innovation? One way is through sociotechnical integration, which brings social scientists trained in ethics together with natural scientists in the lab. Fisher has seen first-hand success in these collaborations - he worked in a nano-scale engineering laboratory and partnered with an engineer like the one in the above example. Together, they talked through the research process and realized that by simply using a different chemical catalyst, they could mitigate potentially negative environmental impacts of the project and improve worker safety.

At ASU, Fisher helps doctoral students studying ethics and responsible innovation to find laboratories that are willing to try these types of collaborations. They work with the natural scientists to understand their research and ask some fundamental questions – like what are you doing, why are you doing it, how could you do it differently and who might care. When concerns or challenges arise, the natural and social scientists tackle them together.

Another impetus for responsible innovation is when science the public doesn't understand is funded. For example, many people are skeptical

about the safety of eating food with genetically modified organisms (GMO's). Others are apprehensive about the use of nuclear power. Does it make sense to invest lots of time and money into these scientific endeavors without giving thought to how society will react to them?

"We can't move forward laying the foundations for a new technological infrastructure that's going to change social, ethical, cultural relations, without checking with the people and providing an input for them so that they realize, there are values at stake here, and you need to weigh in," Fisher said.

Provided by Arizona State University