Scientists Still Need to Study the Liberal Arts

Modern education tends to focus on STEM – the acronym for "Science, Technology, Engineering, and Math" – to the exclusion of the liberal arts.

But when it comes to education, it shouldn't be an "either-or" between the sciences and the liberal arts but a "both-and." The liberals arts offer an indispensable foundation for those who wish to excel in scientific fields.

This belief permeates the classic division of studies that prevailed throughout most of the Western history of education. Students would first complete the *trivium* – grammar, rhetoric, and dialectic – before moving on to the *quadrivium*, which consisted of studies in arithmetic, geometry, music, and astronomy.

In recent centuries, of course, other sciences were added to, and interchanged with, this advanced course of studies represented by the *quadrivium*. And one should note that this taxonomy of the *trivium-quadrivium* was not always rigidly followed, as basic math has always been part of the elementary school curriculum. Nevertheless, it testifies to a long-acknowledged role of the liberal arts as a necessary preparation for the sciences. Even at the beginning of the twentieth century Alexander Bauer, distinguished professor of chemistry at the Technical College in Vienna, could still without hyperbole say, "Give me a student who knows his Latin grammar and I will answer for his chemistry."

But today, due to both the attenuation (read: "dumbing down") of the high school curriculum and the pressure to specialize at earlier ages, most would-be scientists do not receive a thorough grounding in the liberal arts. As a result, they tend to lack important skills that would make them more well-rounded thinkers and communicators.

For example, as Cornell University president David Skorton lamented last year, "[M]any of us [scientists] never received the education in the humanities or social sciences that would allow us to explain to nonscientists what we do and why it is important."

A more thorough grounding in the liberal arts might also lead scientists to more frequently ask themselves an all-important question: "Just because we *can* do this, *should* we?" Along these lines, microbiologist Masanobu Fukuoka of *The One-Straw Revolution* fame came to believe that "Before researchers become researchers they should become philosophers. They should consider what the human goal is, what it is that humanity should create."

It's important that the U.S. remains an innovator in the field of the sciences. But, as Rhodes College chemist Dr. Loretta Jackson-Hayes argued in the *Washington Post*, scientific innovation will not be accomplished apart from the liberal arts:

> *"As a chemist, I agree that remaining competitive in the sciences is a critical issue. But as an instructor, I also think that if American STEM grads are going lead the world in innovation, then their science education cannot be divorced from the liberal arts."*