

Ten Important Reasons to Include the Humanities in Your Preparation for a Scientific Career

By dalbertMay 12, 2011

It is common to hear undergraduates and recent college graduates preparing for a career in science complain: “I think I wasted a lot of time in college being forced to take humanities classes that had nothing to do with my area of study.” This is one of many manifestations of the [ongoing](#) centuries-long battle over the relationship between the sciences and the humanities.

From a historical point of view, until the mid-19th century, the humanities (i.e., grammar, rhetoric, history, literature, languages, and moral philosophy) held the upper hand. At Oxford and Cambridge Universities, the gold standard models for American education, the areas of study [consisted mainly of classics, mathematics, or divinity](#).

However, in 1847 Yale College broke with this tradition and formed the School of Applied Chemistry. This became the Yale Scientific School and in 1861 it was renamed the Sheffield Scientific School. Sheffield’s 3-year undergraduate program focused on chemistry, engineering, and independent research. It offered the best scientific training in America. The “Sheffs” studied and lived apart from other undergraduates taking the classic curriculum and roomed together in the “college yard.” The two groups did not mingle. The old truism that a classical education assured success was being challenged. Science had begun its separation and was ascending vis-a-vis the liberal arts in American universities.

The need for science majors to take courses in the humanities has been contentious ever since. The required core curriculum at most colleges and universities has atrophied over the years, while at the same time governmental funds for support of any new research in the humanities has dried up. Authorities both within and outside of science have expressed concern that scientists do not learn enough about the humanities — to the detriment of society.

In this environment, it’s difficult for the undergraduate to determine the desirability of taking courses in the humanities — or which and how many to take. In fact, some applicants to college regard a strong core curriculum requirement as a negative factor, opting instead for programs with a minimum number of required core courses and maximum flexibility.

All this considered, I would offer the following 10 reasons why students pursuing science careers should augment their education with a strong foundation in the humanities.

1. The humanities prepare you to fulfill your civic and cultural responsibilities.

The reason that John Harvard left his library to the college in Cambridge, Massachusetts, that Jane and Leland Stanford founded Stanford University, and that states established land-grant colleges was to educate cultured and useful citizens. The humanities provide an insightful understanding into moral, ethical, political, and ideological forces. A successful society depends upon altruism, charity, civility, compassion, and generosity, and the humanities evaluate and emphasize the importance of these characteristics. The liberal arts introduce aesthetic values to the student. While it may not be obvious how these characteristics are essential to

finding a research position in academia or industry, they are key to a full and meaningful life.

2. Studying the humanities allows you to become familiar with and use the creative ideas from great minds outside of science.

Biography, literature, and history offer a window into the understanding of human nature and society. They introduce us to thoughts and ideas from outside our specialist areas and can have relevance to finding new directions and enhance creative thinking.

For example, a classic case that demonstrates the influence of humanities on science can be seen in Charles Darwin's development of the theory of evolution by natural selection. In his *On the Origin of Species*, his autobiography, and other writings, Darwin revealed that the principal insight that led to his theory of evolution was his knowledge of Malthus' population theory. This states that populations increase geometrically while food supplies grow arithmetically. Robert Young, who carefully traced this link in his 1969 publication, *Malthus and the Evolutionists: the Common Context of Biological and Social Theory*, points out that assumptions in the humanities about human nature and society contribute fundamentally to approaches taken in the scientific study of nature.

3. The state-of-the-art scientific knowledge and techniques you learn in college have a limited shelf life; mastering the humanities provides tools for extending it.

Just as cars have an approximate 10-year road life and high-tech gadgets last 2 or 3 years before they become obsolete, the preparation for a scientific career one receives in graduate school leaves the individual competitive for a finite period only. The study of humanities, both in its pursuit and the perspective it provides, rewards the student with the skills needed for self-critical reflection, adaptability, and self-teaching. These are the functions needed to be an independent learner, thereby extending one's scientific knowledge and teaching abilities throughout his or her professional career.

4. Humanities study strengthens your ability to communicate and work with others.

Scientists chafe at the stereotype held by some that they belong to a class of socially awkward "geeks" that are unable to communicate their ideas clearly. The old "classical" liberal arts education was pursued in large measure because the materials studied and the methods of study enhanced one's ability to work well with others and communicate properly via the spoken and written word. These rewards still apply and remain useful in securing good jobs, gaining advancement and promotions, and obtaining grants.

5. You will gain knowledge of foreign languages and foreign cultures.

With globalization, this is increasingly seen as a requirement for a successful career in commerce and industry. It is also helpful in science and medicine. When I was in college number of years ago, it was a widely held belief that a proficiency in German —

scientific German, in particular — was of great importance to scientists and physicians. While this has been helpful to me throughout the years, my lack of proficiency in Spanish has been a handicap in my clinical practice, requiring the use of a translator with Hispanic patients unable to speak English.

Although we assume English to be the universal language of science and medicine, this isn't the case in every country. Moreover, all non-English speaking countries retain their national pride. Years ago, a colleague of mine was invited to give a “name” lecture in Japan. He spent a great deal of time and effort translating his lecture into Japanese and rehearsing it so it would be intelligible to his Japanese audience. His efforts paid off handsomely in terms of subsequent collaborations, visiting professorships, and fellowship applications from Japan.

6. The walls that exist among disciplines has been lowered and students can move across disciplines more freely.

The concept of a core curriculum has changed and students have increasing flexibility, largely as a result of information technology. Victor Coelho, associate provost at Boston University, [gives a good illustration](#):

Recently I worked with the Office of Information Technology on [this course selection database](#) that crawls through all the course descriptions at BU. You can put in keywords to find all the courses with descriptions having those words, and you would be amazed at how many people are discussing the same thing. For instance, in typing in theoretical physics, you would have no idea that there's an art history course discussing theoretical physics. Or put in Africa, and you'd be amazed at how many courses at this university deal with Africa from so many perspectives. It showed me how fluid a university could be. You could actually see all of the possibilities of a university teaching in a holistic manner, allowing students to stay tethered to a major, but have that tie be very, very long.

7. Students can benefit from advice on which courses to take.

Without the benefit of experience or advice, students choosing courses in an abstract manner can make poor decisions. In many instances, students do not know the value of a particular course until after they've taken it. It is difficult to determine how useful a course in Russian literature — or advanced calculus — will be in one's career without information from other people further advanced on the same career track. To provide that information is the job of one's advisor or mentor, who can knowledgeably speak to the importance and usefulness of particular courses.

8. Humanities study helps you understand the impact that science, technology, and medicine has had on society and understand the future scientific needs of society.

The study of literature, history, and philosophy shed light on the influence science has had on the quality of people's lives and on the shaping of society, both

positively and negatively. These studies also inform us of society's needs and are important considerations for the concerned scientist to appreciate and learn from, including the consideration in where he or she chooses to work and what projects they undertake.

9. Interdisciplinary learning adds value to one's degree.

In a significant measure, the diploma we receive at graduation defines and symbolizes who we are and what we are qualified to do. But its true value is derived from what we have put into our head and our heart. A broad knowledge that includes the essentials of the humanities is an important complement to our scientific training.

10. Humanities study teaches you that the supposedly sharp dichotomies that separate science from humanities do not really exist.

It is a general belief among scientists that science deals with facts and the humanities deals with values. But as Robert Young [astutely notes](#): “Science, technology and medicine — far from being value-neutral — are the embodiment of values in theories, things and therapies, in facts and artifacts, in procedures and programs . . . I am suggesting that science is part of culture . . . [and] that research traditions cannot be reasonably claimed to be set above the prevailing world view of the epoch.”

And that, in summary, I believe is the most compelling reason why the knowledge of values gained through the study of the humanities is important to you as a scientist.