

PROFESSIONAL AUTOBIOGRAPHY: A PERSPECTIVE OF THE CULTURE AND PRACTICE OF SCIENCE IN THE PHILIPPINES

Ma. Assunta Cuyegkeng

INTRODUCTION

When I ask my students how they define science, they usually say that it is an “organized body of knowledge.” I do not like this definition because it makes science sound so stagnant and like a set of encyclopedia for show. I prefer the definition that highlights science as a process. Science is a rational inquiry into our world (Garcia 2003) and seeks understanding that is derived from a logical structure and that produces mental models to help us represent the world. Because of the logical structure and the mental models, there is a clear effort to make this understanding objective or separate from the persona making the inquiry. Steven Rose (2003) describes this aptly:

As humans trying to understand and act upon the world we inhabit, we work with several languages. Speaking of our own experience we talk personally, subjectively. The classical goal of science has been to eliminate this personal subjective quality of language and replace it with a voice of claimed objectivity.

However, the elimination of the subjective quality of language is not achieved simply with the writing or speaking style. It is further achieved through systems that promote verification

of results and peer review. Ultimately, these attempts to objectify actually highlight the social nature of the scientific endeavor.

There is the realization that the scientist performs within the context of his/her own spacetime (i.e., within a historical, social, and cultural context). Hence, to minimize the effect of this context, the results need to be verified by peers and experts. Interestingly, these peers and experts themselves are within their own historical, social, and cultural spacetime; so that this has an effect on how materials are evaluated and reviewed. Thus, while we approach a situation of “claimed objectivity,” there is always an interpretation involved, possibly in the context of a particular paradigm, mental model, available technology, or language. Allow me then to share with you my own journey as a scientist trying to find a voice of “claimed objectivity.”

THE CONTEXT OF KNOWLEDGE ACQUISITION, CREATION, AND UTILIZATION IN THE PHILIPPINES

My own professional life story began in third year high school, shortly after martial law was declared, when I fell in

love with the idea that it was possible to see things in the most objective way possible through the world of chemistry. I thought that this was a way of seeing the world for what it really was – an attempt to unveil absolute truth. Perhaps, it was a reaction to the experience of people modifying stories to suit themselves or manipulating facts to deliver a desired outcome.

This belief in science led me to study chemistry at the Ateneo de Manila University and later in Regensburg, Germany, where my mentors reinforced my idea of science as a practice defined by integrity, rigor, and detachment. Knowledge creation and acquisition, in the context of my university experience, promoted these values to a great extent.

I learned from my mentors how to use that knowledge for truth and for service. In the academic context where I flourished, knowledge was used with the pride that comes with intellectual fulfillment after a challenging problem solving process. I also clearly remember occasions when my mentors used their chemistry prowess to do their own version of CSI as early as the 1970s, in order to help government agencies, industries, or consumers come closer to the truth. One clear memory was when our faculty members were asked to help identify what poisoned people aboard a ferry. All they had was the sack which contained the flour or rice. Noticing a stain, they decided to collect a sample of the stain and eventually identified the poison using Infrared Spectroscopy.

Upon returning from my doctoral studies in the mid-eighties, I also saw the strategic vision of my mentors, when they decided to focus on few but strategic areas

of research. Because we were a small department, we decided to choose our niche areas for research. Analytical chemistry, natural products, and chemistry education were already clear choices then, because of the expertise of the faculty members. However, I learned to appreciate two things. The first was that the faculty chose to also go into polymer chemistry at a time when no academic institution was engaged in it, because they had a sense that this would be a growth area in the Philippines. They asked me to move into this area (because I was the newest, although I was not really trained for it) and gave me a lot of support so that I could retool. The second thing that I admired was that when they agreed on their strategic vision, they all worked towards it, even sacrificing their personal research interests in view of the departmental vision.

Clearly, the choice of where to use one's skills and expertise is a product of sociohistorical context and personal beliefs.

THE SOCIAL CONTEXT OF SCIENCE: THE NATURAL SCIENTIST IN SPECIFIC SOCIAL CONTEXTS, DYNAMICS, RELATIONSHIPS

Inasmuch as scientists try to unravel the mysteries of the world, scientists also need funds to run laboratories, develop human resources, and maintain facilities. I had to face this as a young academic trying to establish my research. Getting funds is very much at the mercy of government priorities, industry interests, and to a certain degree, of the scientific community's directions. Most scientists will go where the funding is, or will try to package their research to match

funding requirements. In some cases, there are scientists who can also influence the directions of science if they are savvy enough to market their research or if they have a track record for defining vision. In my case, environment and industry applications were the priority. At first, I chose to work on biodegradable polymers because this was a trend that matched the needs of the environment. However, after about two or three years of work, I gained a philosophical insight. Why was I changing the material to suit society's throw-away mentality, when the problem is with the culture itself? At that point, I decided that I would rather do research in adding value to one of our natural resources, carrageenan, and help the environment by teaching the youth about the effect of our lifestyles on the planet.

Aside from funding, there is the immediate scientific community to understand, especially in the Philippines, where relationships and alliances play an important role. After all, they are the peers who would review proposals, local publications, and awards. Actual scientific practice put content quality as the primary concern, but shortly after I got more involved in the professional and government organizations, there were a few times when I observed that affiliation and reputation could affect the experts' evaluation, and this is stronger in some disciplines more than others.

Eventually, as the structures of the Department of Science and Technology (DOST) were redefined and as academia and professional organizations aimed to make their programs world-class, there were clear efforts to address this. I saw how processes became better defined and

there was a general move towards blind peer review. This is not unusual in science and technology (S&T) today in the Philippines, and it is accepted in today's generation of scientists that even well-awarded ones will go through such processes, just like those who are not.

There is also the element of political correctness. It is not unusual to distribute grants and awards to different geographical regions; this is understandable, if the goal is to assist the regions in growth. This further illustrates that the social context has to be taken into consideration even in promoting scientific work.

As I matured in my scientific and administrative roles, I realized that, even at the level of knowledge creation and acquisition (a task for our universities), the dynamics of departments and schools can change the fabric of scientific inquiry. Personalities and factions can compromise the growth of scientific endeavor because opportunities like grants, support for conference fees, etc., are perceived to be given in favor of privileged groups. Clearly, these take a toll in terms of how much we can move forward in S&T in the Philippines.

THE FUTURE OF SCIENCE IN THE PHILIPPINE CONTEXT

Through my career, one of my concerns was the growth of future scientists of the Philippines. One direct contribution was through mentoring of budding scientists, so that they may be introduced properly to the world of research. I realized that my own understanding of the practice of science came largely from the example of my own mentors, and I, too, need to pass this on.

However, mentoring just a few students seems too narrow and even parochial, when we think of the bigger Philippine society. I asked myself why there were so few people who went into science, why naturally curious children suddenly lost interest in discovering the world. I asked myself why science teaching turns off many of our youth. In 1989, I started a workshop for teachers of high school chemistry, ChemTeach, where teachers would be encouraged to use fresh approaches. This took off from a program, ChemStart, which was started by my professor, Fr. William J. Schmitt S.J., who wanted to initiate the youth into the world of chemistry when they had no preconceived notions yet. I thought that a parallel program for teachers would further create a multiplier effect. Not satisfied, I eventually became involved in looking for ways to improve elementary science education in 1994. Since then, I have devoted part of my personal career in science education, because before we can even have scientists in our midst, they will begin as children who need the proper outlook in the practice and values of science. Because our teachers are generally not properly trained to do science, they end up with the boring bookish strategies or predictable cookbook experiments. My pre-occupation now is to provide opportunities for our scientists and science teachers to get to talk with each other, so that they may get a better appreciation of each other's role in helping science to grow in this country.

Finally, we need to help our young scientists realize that their competency is one of their contributions to national development. Whether they go into research to gain understanding of our world, or go into industry where their mental models may be translated into products, or go change our culture through their voice of claimed objectivity, they would have changed our nation for the better.

FINAL COMMENTS

My professional life has gone through profound changes and continues to do so, because of the changing social landscape. Science is a social endeavor; it is never performed in a vacuum. While truth in science comes from an observer's effort to understand a world that is out there, the meaning we put into our scientific endeavor builds upon the relationships we have forged as professionals.

With this perspective, I have tried to broaden the boundaries of my professional space by venturing into areas such as Science and Society as well as Science and Religion. Perhaps, this reflects a personal need to integrate the personal and professional aspects of my life so that I may see the world with different perspectives, and always be open to seeing it with new eyes.

REFERENCES

Garcia, Jerrold

2003 "Science and the Scientific Method." In M.A. Cuyegkeng (ed.), *Romancing Science: Readings in Science and Society*, Quezon City: Ateneo de Manila University ORP.

Rose, Steven

2003 *The Making of Memory*. UK: Vintage.