A Study of Higher Education in Japan that Values and Fosters Interdisciplinary Collaboration

Akinori Yamabe
The University of Tokyo (Japan)
cyamabe@mail.ecc.u-tokyo.ac.jp

Abstract

Modern day issues in science and technology arise from a complex background, one that encompasses many different areas of knowledge. When developing public policy with respect to science and technology and its relationship to society, it is necessary to draw upon a broad range of specialties and professional expertise. Interdisciplinary, interprofessional collaboration between scientists is so important that it should not be limited to emergent problem solving, but, instead, should be developed and trained as part of the education process. This study considers the interdisciplinary approach to science education at the University of Tokyo in Japan.

1. Introduction

First, to lay the background, I'd like to consider some of the characteristics of contemporary issues related to science and technology. Answers to complex issues such as the environment or public health draw heavily upon science, but not upon any one specific field; instead, they rely on many different scientific specialties. What's more, these problems are so complex that they extend even further, beyond the domain of pure science, to intertwine with broader social, cultural, economic and political factors.

In order to address effectively these complex issues, we need to better understand the relationship between science, technology and society, and encourage greater professional collaboration and cross-disciplinary education.

2. A Case Study—Science Communication Program in the University of Tokyo

I'd like to introduce our education program: The Science Interpreter Training Program at the University of Tokyo. We think that an interpreter of science should know the broader impact of science, not only the hard science behind public issues related to science research, but also the ethical, legal and social factors. We often refer to this as the ELSI of scientific research. The students who participated in our program came from a wide range of fields, such as pure science, engineering, agriculture, law and public policy, pharmacology, architecture, education and more.

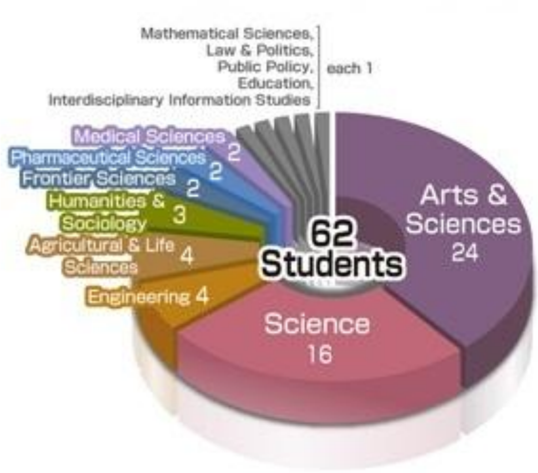

Fig 1. Students' Major Studies

We aimed to make the program's pedagogical methods similarly cross-disciplinary, mixing traditional lectures with workshops. There are three primary units in the curriculum for our education program: theory, expression and a research project, through which students (1) learn in lecture the theory and history of science communication, (2) in workshops, discuss and learn the ways in which the theory finds expression in real life, and (3) develop their core interests through research projects.
Each year, many students choose to conduct their master's research on various topics; these are just some of the many student research projects that came out of the science interpreter training program.

- Measures that universities should take to protect their students against new strains of influenza;
- Risk communication about new strains of influenza; and
- Interviews about and analysis of heredity counselling
- Research of citizens' literacy regarding Alzheimer's disease;
- Proper understanding of issues relating to genetic modification.

Some students focused on pandemic influenza issues, from a viewpoint of risk communication. Students majoring in law considered the role of science in the court by conducting surveys and using statistical research methods. Theoretical studies also examined the response of citizens to science and technology issues. We recognized significant circulation between different fields of study among students.
Entitled "What is an iPS cell?," the book explains a complex topic through explanations, photographs and illustrations that make it easy for an average, non-scientist audience to understand. It familiarizes a lay audience with problems that arise from topics such as regeneration medicine and clinical ethics. This is not the work of a seasoned and professional writer, but of a young graduate.

Fig 2. A text and booklet made by graduates

They have been able to find employment in various fields. We hope and believe that many of our students have graduated from our course as a scientist with the spirit of the science interpreter. Most notable are that students have found work at the ministry of education, culture, sports, science and technology and at the Japan Science and Technology Agency. We think it's meaningful that students educated through the Science Interpreter Program can go on to help shape the country's policy to improve science literacy education in Japan.

3. Conclusion

I would like to draw some preliminary conclusions and perspectives. First, interdisciplinary (cross-disciplinary) education, such as science interpreter training program, will give the student awareness with a view and an idea different according to a different specialty even if it is the same object. This new education has the potential to contribute to the traditional science education. And those can foster basic skills needed in various professions in modern techno-scientific society. Furthermore, these educations are effective for dealing with complex social problems. We think it leads to the improvement of the overall judgment based on various viewpoints in a social decision making.
There is need for further follow-up investigation to find how graduates of the program act in the society. It would be an interesting research theme in the future.