

Problems and Possibilities of “General Science Education” for College Students

Yung Sik Kim

Seoul National University, Seoul, Korea

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As modern science was accepted by the universities, the sciences of the universities become gradually specialized. By the late nineteenth century, the basic structure of the university science, composed of the specialized disciplines as we see today, was established. Afterwards, the science in the universities kept increasing the degree of specialization while maintaining the skeleton of the same structure.

Such specialization initially contributed to the growth and development of sciences, and helped to create a social role of science that included the application of science to industry. And this led the universities and society to support science. Yet, while the science in the universities was following this path of ever increasing specialization after the mid-nineteenth century, the way science was practiced, and the place and role of science in society continued to change. There appeared many problems which had not existed a century ago, and the specialized sciences of the universities became less and less capable of dealing with these problems.

To be sure, a great deal of these problems are the problems for the scientists themselves. But the changes mentioned above created problems for the general population also. Even the task of “managing” the big, expensive, industrialized science is not the work of scientists alone. Moreover, everyone living in the modern world has to face those problems that are becoming increasingly more serious for the entire population, which are either created by science or at least related with it. Indeed, science has come to be connected with most problems of modern society.

Meanwhile, the science of the university has become ever more specialized in its content. This has made the

university science, which had already been separated from the general public because of the difficulty of its specialized content, even more alienated from them. The specialization has gone too far for the university science to be able to deal properly with the needs and problems of the society; it has even become indifferent to them. This kind of situation can easily lead to an atmosphere of “anti-science”; it even contains a danger of making science a factor of social conflict.

The task of educating the general public properly so that they can live in a society in which the above kind of problems are becoming increasingly more important falls on the education of science as “liberal arts”—the “general science education”.

2

In most Korean universities the targets of the general science education are the students who do not major in sciences or related areas (hereafter, “non-science students”). A common characteristic of these students is that they are generally ignorant of the sciences, and often have prejudices against them. Yet, when they graduate and enter society, they face, and are forced to deal with, the above kind of problems. The result, then, will be a society in the future, in which these non-science students, ignorant of, and prejudiced against, science, have to play leading roles in the science and technology policy and administration, dealing with numerous science-related problems and making decisions on them.

This is an ominous situation. The need for a proper “general science education” for them, which will provide them with a correct understanding of science, and prepare them to deal with many science-related problems, is obvious. It is important for the future of the

society. Moreover, it should be noted that general science education in the universities will be the last chance for the non-science students to learn about science, and thus, general science education for non-science students can be considered even more important than science education for the students majoring in the sciences.

3

It is not possible to teach, in general science education, the technical content of all sciences. On the other hand, however, general science education cannot do away with scientific content entirely. It becomes thus necessary to make selections from various contents of all the sciences. One thing is clear however, that such selections should be made for students, and not for teachers.

What are usually mentioned as goals of science education—1) acquisition of scientific knowledge, and 2) fostering scientific attitude and mentality—cannot be the aims of general science education. These two aims should of course be essential ingredients of general science education. But they are aims that should be pursued in secondary schools, and are neither appropriate nor possible for university-level general science education.

Those non-science students who take general science courses will live in society not as producers of scientific knowledge, but as its consumers, users, and managers. Thus, the problems awaiting them are not what can be solved by specialized scientific knowledge. To deal with them, it is far more necessary to understand the nature of scientific knowledge, the characteristics of scientific activity, and the relation between science

and various elements of society, than to learn the detailed contents of sciences. And in the course of dealing with these problems, the general science courses should teach students to see science not just as a finished form of organized systematic knowledge, but also as an important cultural and social phenomenon in modern society. That will be the true goal of the general science education in modern society.

4

It will be necessary for a university to select courses appropriate for the university and its students. It is important, however, to make a broad range of courses available to the students so that they can make a balanced selection from them. A considerable freedom should be given to students to make such selections. Also, the general science courses should be taught by specialists, who possess not only sufficient knowledge of scientific content but understanding of the science-related problems discussed above.

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General science education should also be provided to the students majoring in sciences. First, they also face and deal with the above-mentioned science-related problems in society in which they live as citizens. Often, they are expected to help the general public to make choices or decisions about these problems. Moreover, many problems these students will face in the future working as scientists are not problems of scientific content. General science education in the universities will provide the students majoring in sciences with understanding that will be helpful for them to deal with these problems.