

Japan: Decline of Doctoral Applicants—Crisis for Innovation?

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Doctoral degree holders are seen as an engine for innovation, and their number has been increasing in leading countries. OECD data shows that, between 2010 and 2017, the number of graduates from doctoral programs or equivalent levels increased from 57,407 to 71,042 in the United States and from 18,756 to 28,143 in the United Kingdom. However, it slightly decreased from 15,867 to 15,674 in Japan. More significantly, in Japan, the number of new entrants to doctoral programs has been decreasing from its peak of 18,232 in 2003 to 14,976 in 2019, according to the annual survey by the ministry of education, culture, sports, science, and technology (MEXT). The number of international doctoral students, many from Asian countries and especially from China, was about the same level at 2,643 and 2,664 in these two years, and their percentage increased from 14.5 percent to 17.8 percent. While the presence of international doctoral students has been increasing at Japanese universities, so far institutions do not seem to be able to compensate for the overall decline in number of Japanese doctoral students.

Background and Potential Reasons

One of the reasons why doctoral programs are not so popular among young Japanese is that a doctoral degree is not perceived as helpful to enhance employability at Japanese companies. Moreover, the average salary of doctoral degree holders is not necessarily higher than that of master degree holders. To give some context, in Japan, until the early 1990s, the primary purpose of doctoral programs was to train future faculty and researchers to work in academia. After 1991, the capacity of graduate schools was extended by about 2.5 times to educate highly skilled professionals. However, owing to the long tradition that doctoral programs were to train graduates to pursue academic jobs, there is a mismatch between the skills developed during the programs and those expected by Japanese companies. In a survey by the National Institute of Science and Technology Policy (NISTEP) in 2012, many Japanese companies reported that although doctoral recipients have specialized knowledge, it is challenging for them to apply their knowledge and skills immediately to the companies' needs. This problem is also applicable to international doctoral students who look for jobs at Japanese companies.

Additionally, young Japanese are discouraged from pursuing doctoral degrees because the academic career of graduates has become unstable. This situation became apparent with the budget cuts that Japanese national universities suffered in 2003. According to NISTEP, among doctoral recipients in 2012, roughly 60 percent found jobs at universities or public research institutes. However, more than 60 percent among them held nontenure track positions, with 70 percent among those on contracts shorter than three years. The salaries of nontenured employees tend to be lower than that of staff with tenured positions or working at private companies. Also, the brevity of contracts makes it difficult for young researchers to select and work on research topics requiring a long-term commitment. This issue also affects international doctoral students. According to the same report, international doctoral students tend to look for academic positions. After graduation, more than half go back to their home countries to work.

Another reason why young Japanese do not pursue doctoral degrees is that financial support is quite limited. In contrast, some international doctoral students receive MEXT scholarships for their studies in Japan, and many other privately funded international students receive tuition exemptions. According to MEXT's report of 2014, nearly 50 percent of doctoral degree recipients received no financial support for their doctoral studies.

Abstract

For a number of reasons, while the number of doctoral graduates has been increasing in leading countries, in Japan the number of new entrants to doctoral programs has been decreasing. In order to bring innovation to society and industry, Japan needs to enhance the attractiveness of its doctoral programs with stable and long-term support.

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The most extensive research fellowship program, by the Japan Society for the Promotion of Science (JSPS), provides JPY 200,000 per month to doctoral students, which is about US\$1,900; however, this fellowship is awarded to less than 5 percent of new entrants to doctoral programs. Also, earnings from research assistantships and teaching assistantships at Japanese universities are not sufficient to make a decent living. This is comparable to the situation in the United States, where nearly 80 percent of students primarily fund their doctoral study with either research assistantships, teaching assistantships, fellowships, or scholarships, according to the Survey of Earned Doctorates in 2019.

The Government's Response

As one way to enhance the attractiveness of doctoral programs in Japan, MEXT conducted a project called "Leading Program for Doctoral Education" from 2011 to 2019. In this project, 62 five-year PhD programs at 33 universities received competitive grants to develop a doctoral program to educate leaders equipped with both specializations and broad perspectives to work globally in academia or outside of it. In many of these programs, professionals from private companies taught some courses, and students were encouraged to do internships in companies as well as to do research abroad. MEXT reports that, as of March 2018, 96.5 percent of 1,846 students in these programs found jobs after graduating. This was higher than the percentage of all doctoral recipients that year (72.1 percent of a total of 15,658 graduates). Moreover, 42.6 percent of graduates of the MEXT project pursued nonacademic careers, for example in companies or government organizations, which is also higher than the overall percentage (25.1 percent).

Though the Leading Program seemed to be successful in increasing the link between doctoral programs and nonacademic careers, one of the main problems of recent governmental projects is that they tend to be limited to a fixed term. By the time the Leading Program project ended in 2019, a similar project, "Excellence Graduate School," had started in 2018. However, it is also a fixed-term project, basically lasting seven years. At the end of January 2020, the Council for Science, Technology, and Innovation discussed new goals to enhance the attractiveness of doctoral programs, including an increase of financial support for doctoral students. In December 2020, it was reported that MEXT provides up to JPY 2,900,000 (about US\$28,000) for about 7,000 doctoral students (about 10 percent of all doctoral students in Japan), although the details of this support have not been announced yet. It is also reported that this support will be a stable one, which is what Japan needs to enhance the attractiveness of its doctoral programs and bring innovation to society and industry. ▲

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