

Break down the vertical society that is ruining Japan

~Sending Young People Abroad & Reviving Japan with Human Resources Who Can Work Across Organizations and Borders to Revive Japan~

It has long been said that the research performance of Japanese universities has been in a state of decline. According to the "Science and Technology Indicators 2021" released by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) this August 10th, Japan dropped one place from the previous year to 10th place in the number of important papers (papers that are cited in the top 10%). In the late 1990s, Japan used to be 4th, but has been declining ever since.

According to the "World University Rankings" released in September 2020 by British educational magazine, Times Higher Education (THE), the top 10 universities were dominated by American and British universities, while China had six universities in the top 100, including Tsinghua University in 20th place. The only Japanese universities in the top 100 were the University of Tokyo in 36th place and Kyoto University in 65th place.

The biggest reason for the Japanese universities' stagnation of the research power is the vertical research laboratories where a hierarchy based on seniority has been formed, which has continued since the Meiji era. I have long argued for this and called for improvements, but as far as I know, this has not yet changed. This is a problem not only in university laboratories, but in whole Japanese society. In order to overcome this problem, young people should be encouraged to go abroad. Without young people playing an active role, Japan will not be able to stop its decline. Breaking down the vertical society is the most important task that Japan needs to implement now.

The persistence of a hierarchy dominated by a seniority system

The problem with many Japanese universities is that young researchers, such as associate professors, assistant professors, and post-doctoral fellows, write papers as if they were the hands and feet of their elderly professors. By working for such professors, one becomes eligible for sought-after credit as a co-author of the paper, which is considered an achievement. In this way, those who remain at the same laboratory accumulate recognition for their achievements over time, and often promoted accordingly.

According to a statistical survey of schoolteachers conducted by the MEXT, the average percentage of university teachers in Japan who are alumnus of the same school is 32%. This figure rises to over 42% for national universities.

The percentage of assistant professors hired by prestigious American universities such as Stanford, Harvard and Yale who graduated from the same institutions represent only a few percent in the single digits. Even at the nine University of California (UC) schools including UCLA, which is known for their high rate of alumni hiring, the rate for assistant professors was only 22 %.

In the U.S., when a person goes from undergraduate to graduate school, or when a person finishes graduate school and gets a job as a postdoctoral fellow, he or she basically goes to different institution. While Japan has been trying to encourage increase postdoctoral research

activities and participation since the late 90's, the basic spirit of "Go Elsewhere" has yet to take root, with many people choosing to remain with the same professor forever. Thus, the "vertical" structure remains literally undisturbed.

Dr. Steven Chu, a physicist who served as the U.S. Secretary of Energy in the Obama Administration, who also won the Nobel Prize in Physics in 1997, was once offered an assistant professorship following his postdoctoral fellow at the University of California, Berkeley, but many people around him advised him to turn it down and he joined Bell Laboratories. "I'm glad I did it," he said. It was indeed a good thing because he did his Nobel Prize-winning research there. He later became a professor at Stanford University.

I don't go to the U.S., and if I do, I'm coming back home right away.

There is data on the nationality of people who stay in the U.S. on temporary visas to obtain a doctorate; the overwhelming majority are from China, with 4,000 to 5,000 people each year. There are also about 2,000 from India, 1,200 from Korea, 700 from Taiwan, and fewer than 200 from Japan these days. That last number, honestly, sounds unnaturally low.

The problem is not only the relatively small number of Japanese in the doctoral programs; Japanese researchers who join overseas laboratories after receiving their doctorates usually return to Japan after only about three years and resume work in their former laboratories for their professors. In order to stay abroad, one needs to have the energy to survive the fierce competitive research environment, and should one return to Japan mid-career, there is often no vacancies. The value system as it stands, strongly encourages a return to Japan within three years.

With such a lax attitude, even if one goes abroad for training, most will not be able to develop the ability to work independently in an international research network. Chinese postdoctoral fellows on the other hand, come to the U.S. with the mindset to somehow become independent researchers and, if possible, move to the United States. Their motivation for their study is different from the start. A person who hasn't taken full advantage of their training to grow their abilities and knowledge, will be left unable to meaningfully contribute to their old laboratories through creative stimulation and new ideas.

The old structure that discourages people from the desire "I want to research abroad"

The only way to counter this stubborn attitude is to create opportunities for young people to go abroad in their youth. According to the "Survey on the Current Status and Mobility of Human Resources in Research Organizations" by the National Institute of Science and Technology Policy, 60% of young researchers under the age of 37 in natural science university organizations and public research institutions in Japan have indicated a positive interest conducting overseas research activities.

However, they are discouraged from doing so. The top reason for nixing such thoughts is "I am not sure if there will be a post for me to come back to Japan after I move overseas". The next reason is "lack of connections to transfer to overseas research institutions." I believe these attitudes represent a deep ingrained fear that was successfully implanted into our

current researchers thanks to decades of negative reinforcement by the research community's "Old Guard".

This is due to the fact that there are few people with overseas experience in the upper ranks of both Japanese universities and companies. According to the institute's "Survey on Human Resources in Science and Technology," more than 90% of Japanese researchers lack any overseas work experience. Leaders from all walks of life, including politicians, businesspeople, and educators, should take a proactive stance and measures to turn this situation around.

Vertical laboratories were useful after the Meiji Restoration in catching up with the West because they allowed the advancement of education and research to grow in an integrated manner. However, we are in different era now; what is required above all are, new ideas and innovation.

For overseas researchers, it is common to move from one university, company, or research institute to another as their career progresses. This increases the mobility of human resources in the research field in that country. The different approaches, viewpoints, and novel ideas cultivated in the various organizations that host these researchers, serve to form the basis for new ideas, further strengthening the research capabilities at a national level.

Professors should foster the "next generation" rather than merely training their successors

The role of professors is not to train their own successors. What their job is, to nurture independent researchers who will lead the next generation.

In the 1980s, the late Ezra Vogel introduced many to Japan's Economic Coming of Age with his best-selling book, "Japan As Number One". Many Japanese bought the book just for the title, mistaking Dr. Vogel as declaring "Japan Is Number One". In hindsight, I sometimes wonder whether this was a clever trap set by the Americans, baited with hubris, to effectively thwart the Japanese.

The senior citizens currently occupying the upper echelons of Japan's research institutions have had their share of success, in their own time. Japan had grown to become the second largest economy in the world, and at one time, ranked fourth in the world in terms of the number of important research papers. These notable achievements of the past now serve another purpose: to strengthen the resistance toward any suggestion of changing the way they have been doing things thus far. The more one remains surrounded by mostly like-minded Japanese people, the less aware one is inclined to be about the critical nature of the situation.

People are inevitably captured in the successes of the past. However, if we remain complacent, the gap with the rest of the world will only widen. There are few researchers visiting Japan and few going abroad. Most Japanese universities are completely inward-looking and are clearly out of touch with international research networks. It can be said that these universities are in an "S.O.S." or "State of Seclusion".

Youth are the key to escaping the clutches of the Showa Era

There is a clear limit to the amount of research that can be done by looking inward and working hard. That is why Japanese researchers need to venture abroad for training, and

professors should be actively sending young researchers out, rather than keeping them as their students.

I do have some personal experience in this regard; going abroad makes it possible to view one's own country from alternative perspective and objectively perceive both its innate strengths and weaknesses. Young researchers who are able to support themselves after going abroad will realize the strangeness of Japanese universities, where associate professors and assistant professors are still considered to be subcontractors for professors' research. This sort of realization could finally spell the beginning of the end of this inward feudalistic practice.

And this is not just limited to the field of research. In every organization in Japanese society, there are people seated in the upper echelons who live each day through their memories of their Showa Era Glory Days. An era when manufacturing, Japanese manufacturing – *monozukuri* - was at its peak, with strict discipline applied to the youth as if it were religion, and young people surmise about bosses' feeling (*sontaku*) as a way to survive. All now for ruin.

Today's Japan remains stuck in the Showa era. The ghosts of the Showa Era occupy every organization to enforce their precious vertical structure. Despite concerted efforts by Administrative Reform Minister, Kono Taro, to get the Japanese bureaucracy in Kasumigaseki to give up their stubborn addiction to the fax machine, but was unable to complete it. When the world viewed the Opening Ceremonies of the Tokyo Olympics, few probably realized they were being inadvertently treated to a show resembling a 1980's TV production. And, as Japanese public health centers worked to combat COVID-19, puzzling scenes to some of staff conducting interviews with infected patients on landlines with notes all taken down with paper and pen.

To break down these vertical constraints of society, and end their continued contribution to Japan's decline, there is a concept that needs to be promoted - diversity. In this instance, it is necessary to encourage companies and organizations in a way to take advantage of diversity - diversity of thought and experience whether borne out of differences in work experience, education, gender, age, or other factors contributing to unique experiential and perceptual viewpoints- to meaningfully foster young talent with the energy to stir up staid research fields, companies, and the nation - without living in continual fear of being disciplined or sanctioned by the top.

If there is to be a next generation of human resources that will revive Japan, it will be born from a young generation that can easily and fluidly transverse boundaries and borders of organizations and countries.

(This article is translated from the RONZA article in Japanese and is not an official English translation of the RONZA.)