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Special Lecture by President Makoto Gonokami

"The University of Tokyo Future Society Initiative: Contributing to the Future of Humanity and the Planet"

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Park In-kook

Distinguished guests and honorable speakers, thank you for joining us at today's special lecture by President Makoto Gonokami of the University of Tokyo.

As all of you probably agree, we cannot overstate the importance of intellectual dialogue and academic exchange between Japan and Korea in the subjects of humanities and sciences. I am greatly honored to invite the first distinguished intellectual celebrity from Tokyo since the inauguration of this conference hall.

For the past two decades, the Korea Foundation for Advanced Studies has been actively engineering academic exchange among Asian countries, especially with China, as exemplified by the Beijing Forum, Shanghai Forum, and twelve other international forums held in China.

Now I believe Japan's participation in the pan-Asian intellectual community is indispensable. My foundation and the University of Tokyo signed a milestone MOU to co-host the first-ever Tokyo Forum next year in Tokyo. We hope that the Tokyo Forum will instigate the establishment of a new platform for academic exchange and knowledge sharing in subjects of humanities and sciences.

Taking this opportunity, I would like to introduce a systematic change of my foundation. You already know, the Chey Institute for Advanced Studies (최종현학술원) was established a few weeks ago, which was made possible through the donation and support by SK Group and its continued dedication to the betterment of our society.

KFAS has been a leading organization in scholarship, fostering a pool of more than one thousand PhD recipients, as well as catalyzing intellectual exchange across Asia. From now on, we will separate these two functions into two different organizations. KFAS will continue its operations of scholarship and education programs. And the Chey Institute will take on academic and knowledge sharing projects including international forums, along with various functions of a full-fledged, nonpartisan think tank. The new Chey Institute will focus on identifying geopolitical risks and coming up with global strategic policies in response to these risks. The Chey Institute will also explore scientific innovation and its risks. On top of that, we will try to delve into the impact of scientific innovation on geopolitical risks and global strategy.

Today's conference is the first official event hosted by the Chey Institute for Advanced Studies. I am very pleased to tread the first steps of the Chey Institute's journey together with all of you here today.

In this sense, I would also like to express my special thanks to President Gonokami, vice president, and the staff members of the University of Tokyo for their strenuous efforts in making this event and our partnership possible.

Without further ado, I would like to introduce today's speaker, President Makoto Gonokami of the University of Tokyo. In 2015, Professor Gonokami became the 30th president of the University of Tokyo, after serving as the dean of the School of Science.

I hope all of you enjoy today's meaningful event, as the Chey Institute for Advanced Studies embarks on its journey as a new platform for international academic exchange and knowledge sharing. I thank you.

Lecture

Makoto Gonokami

Good afternoon. Thank you for your kind introduction. I am Makoto Gonokami, president of the University of Tokyo. Distinguished guests, ladies and gentlemen. It is a great pleasure to be with you here today, and a great honor for me to be able to give a special lecture at this esteemed foundation, in particular, for the first forum of the Chey Institute for Advanced Studies. I would like to take this opportunity to thank chairman Chey, Tae-won and president Park, in-kook of Korea Foundation for Advanced Studies for inviting me. I would also like to thank professor Jeong, jong-ho for his efforts in making this wonderful opportunity to take place.

Last March, I was invited to this beautiful city of Seoul to give a speech at 2018 matriculation ceremony of Seoul National University (SNU). It was an honor for me to say words of congratulations to the future leaders of Korea and share my thoughts with them. In my speech, I mentioned that SNU and the University of Tokyo(UTokyo) have much in common. We both bare similar responsibility and mission to our respective countries, which is to sustain our social foundation and to produce future leaders who can lead all of humanity to a better place. Also, as universities located in East Asia(EA), both universities have created a body of unique knowledge and have contributed to solving social issues and the well-being of humanity. I told the students of SNU that as partners, our university would like to work with them to discover a new and exciting path together in this time of change.

Giving a speech to the students of SNU was great experience for me. This time, I am very much looking forward to sharing my thought and having discussion with all of you on this occasion. Today, we are experiencing rapid development in information and communication technologies, also called the ‘digital revolution.’ This is bringing about a historic transformation both in our economies and societies. This change is very fast and its impact is enormous. Predicting the future is becoming more and more difficult. Our human society is at a serious transition point. The world is changing rapidly. And global issues are becoming more and more complicated.

Many of these issues do not have simple solutions. We need new ideas to solve them. To create such new ideas, people with diverse strengths must cooperate with each other. Universities have individual strengths that have been fostered in their respective cultures. Also, universities have close relationship with individuals and organizations in their respective regions. So, I think that universities should take the lead in creating a new society in collaboration with various sectors of global society. Universities should become a platform for collaboration, where we can link various individuals and organizations from across the world.

I would like to introduce you to some of the activities that have taken place in Japan, and in particular, at the University of Tokyo. I hope these examples will offer a hint to how we can work together to create the better society. Of course, advancement in science, technologies and innovation are key drivers for economic growth and prosperity. However, new technologies may create new challenges for our society. They could also make existing challenges worse. So, how should we use and manage new technologies in order to achieve sustainable development and bring about a better future for all the humanity? I would like to discuss this in relation to Japanese government policy and our university's activities.

As I mentioned earlier, we are experiencing a digital revolution. Some call it the 4^{th} industrial revolution. In September 2016, I became a member of the Council on Investment for the Future. This council was organized by the Prime Minister of Japan. We discuss what kind of future society we want to create and what investments are needed to realize it. We argued that the digital revolution is a great opportunity to solve difficult social issues and create a better society for all. By utilizing new technologies, we can reduce disparities of many kinds. We named this ideal future as **Society 5.0**. The important point is that we can create an inclusive society where diversity is valued and everyone can achieve their full potential. Now, all sectors of Japanese society are working together to realize this Society 5.0.

I think we can call this an upside of the digital revolution. Science technology and innovation are key to solve difficult social issues and create a better future society. We can say this because we already experienced that in Japan. I would like to give you an actual example.

I was born in 1957. I am 61 years old now. When I was a child, Japan achieve rapid economic growth, sometimes up to 10% per year. On the other hand. Pollution became a serious social issue. For instance, at that time, I used to live near the river called the Tama river in Tokyo, catching fish and having enjoyable childhood days. But I remember that it was heavily polluted with domestic wastewater. Very smelly.

But now, as you can see in this picture, it is very clean now. What made this transition possible? It was a combination of technology and social system. Purifying technology of sewage and polluted water were greatly improved. The Water Pollution Control Law, which was introduced in 1970, was also important.

This shows that the combination of technological breakthrough and social system design helps solving social issues. Also, I would like to emphasize that responses from people in the society played an important role. People who live near the polluted water realized that this was a social issue and they worked together to solve it. This shows that creating empathy is very important to encourage individuals to work together for shaping a better future.

Let me give you another example from 1970s. When cities like Los Angeles were suffering from heavy air pollution, the government of the U.S. passed an amendment to the Clean Air Act, also known as the Muskie Act. It mandated a great reduction in automobile emissions. It was a very difficult challenge for companies. But eventually, a Japanese company invented a new engine that meets this high standard. This kind of hard work and sustained efforts by Japanese car companies contributed greatly to the economic success of the Japanese automobile industry.

These examples show that new technologies are important for solving social issues. At the same time, they show that linking these new technologies with economic activity is also important. To

solve social issues, we need to design three things appropriately. They are science, technology and innovation, social system design, and economic mechanism.

This process requires great creativity. This is where academia can make great contribution. Our strength is creating new knowledge and educating people who can use it. Academia today can provide comprehensive and objective input to design innovation, social systems and economic mechanisms. I believe that academia is a key player in creating a better future society.

On the other hand, On the other hand, there are people who are concerned, that the digital revolution will accelerate the increase of disparities of many kinds. For example, in a digitalized economy, the amount of data that companies have and can use will be critical to business success. Data tends to accumulate to those who already have an advantage. The early starters will find it easier to gather more and more data. This will eventually lead to only a few enterprises monopolizing data. This will create a severe gap between those who have data and those who do not. Some call it “data absolutism.” Perhaps, we can call this, a “downside” of the digital revolution. This kind of concern was raised during the last World Economic Forum Annual Meeting in January at Davos.

So, we are now standing at a crossroads. We need to work together so that we all can enjoy the “upsides” of the digital revolution. To make this possible, we need the following two things. One, we should share a common vision of the future and work towards it with a strong will. Two, we should encourage people, especially young people, who want to contribute to solving social issues. The university is the best place to do both.

The Sustainable Development Goals, which were proposed by the United Nations in 2015, are a good tool for sharing a common vision of the future. The SDGs and Society 5.0 have much in common. Both seek to create an inclusive society and both are driven by science, technology and innovation.

At the University of Tokyo, in July 2017, we launched a university-wide program called the "Future Society Initiative". The aim is to promote science, technology and innovation for achieving the SDGs. We do this by making full use of our academic resources across the sciences, engineering, humanities and social sciences.

We have many research activities relating to all 17 of the SDGs. Here, I am showing list of activities for goals 3, 7, and 11. You can see that many activities are already in action. For example, for goal 3, "Health and Wellbeing," we have Sports Science project. As you know, we are expecting the Olympic games and Paralympic games in Tokyo in 2020. For goal 7, "Energy," we have a project on Solar Cell. For goal 11, "Cities and Communities," we have a project on Urban City Design. Various departments are involved in these activities. Many of these activities are inter-disciplinary.

We examined the interconnectivity of about 180 ongoing projects, registered under this FSI. As you can see in this diagram, we have projects for all 17 of the SDGs, in the wide range of research and education at our university. The diagram shows that most projects are related to more than one goal, and the goals are related to one another through these projects. This tells us that the SDGs provide a good framework for promoting connections and collaborations across different disciplines. They also enhance collaboration between our researchers and people from various sectors who want to contribute to solving social issues.

This is an example of the activities of the FSI. Digital Grid, which is the name of a start-up company from the School of Engineering, is providing electricity to off-grid villages in Tanzania. They provide electricity with a "solar lantern," composed of a battery and a solar panel. They are already supplying electricity to about two hundred and forty thousand (240,000) people. Their business is enabled by new information technology and also mobile money payment system. With these solar lanterns, people can work and study during the night. Their local economy and quality of life have been greatly improved.

I mentioned earlier that, to utilize technology to create a better society, we also need to create new social systems and economic mechanisms. This diagram shows our idea of how university can drive economic mechanisms using SDGs. With the introduction of "Principles for Responsible Investment (PRI)" by the UN in 2006, it became many investors' trend to incorporate "environmental, social and governance" (ESG) factors into investment decisions. It is said that this "responsible investment" will realize better risk management, and generate sustainable and long-term returns for the investors. So, it is crucial for companies to work on ESG issues. ESG and SDGs have many in common. So, it would be advantageous for companies to collaborate with universities that are working towards achieving SDGs. And this will generate a larger flow of funding to the university. Important point is that; if we collaborate with more companies using SDGs, we can contribute more to creating a better society, and at the same time, we can strengthen our financial base. This is exactly what our Future Society Initiative (FSI) is aiming to do. Also, my hope is that, through these actions, we can guide our society towards realizing a better capitalism; where everyone's action that comes out of their own free will, will collectively lead to achieving a sustainable development of our society.

New technologies will bring us many opportunities. It is important that universities work together with all sectors of society in their respective regions, to link technology, economic mechanisms and social systems. More importantly, when we work with our local societies, we need to create empathy as I mentioned earlier, using an example of solving water pollution. To do this, we need to share a clear vision of what "a better society" is. Otherwise, we will not be able to create strong synergy. This requires deep understanding about the people in our local societies, including cultural and historical backgrounds and 9 regional characteristics. And this is where knowledge accumulated by social sciences and the humanities becomes very important. I think that universities, with a variety of disciplines, are the best place to serve as a central "platform" for shaping a better future for all. I believe that the digital revolution is a great opportunity for us to utilize new technologies to create a better future for all. This is the last slide.

Lastly, I am happy to inform you that next year, we will be organizing a series of new international symposium called Tokyo Forum, together with Korean Foundation for Advanced Studies and newly started Chey Institute for Advanced Studies. As I have already mentioned, to create a better future where diversity is valued and everyone can achieve their full potential, we must cooperate with various sectors and individuals. I want to make Tokyo Forum a platform for individuals from all over the world to work together to create and realize common future vision. And I am very happy that our university can start this initiative. I am looking forward to cooperating with all of you to shape a better future. Thank you very much for your attention.

Discussion

Hyeon Taeghwan

First of all, thank you very much for delivering wonderful presentation especially on the University of Tokyo Future Society Initiative (FSI). Let me first start by asking question about FSI. A conventional role of universities is education and research, right? That's the major role. On top of that, what you are trying to do is quite different from the conventional role of universities. On the other hand, it seems that a lot of non-government organizations (NGO) and private foundations supported by corporations are doing similar stuffs. What is the difference between FSI and the conventional NGOs and foundations? And What is your strength and future vision on it?

Makoto Gonokami

Thank you very much. I became a president in April 2015. Looking back, so many things have happened in three years and a half. Everything changed very rapidly. At the beginning of my six-year term, I discussed with my colleagues in university to make an action plan for the term, which we named the UTokyo vision 2020 which is the last year of my term. But everything changed more and more rapidly. For example, thinking about the future economy, the value will not be carried by materials but by information and knowledge. From many perspectives, paradigm shift is already occurring. In this point, the role of universities must be very much changed. In such age of rapid change, we need to redesign the role of universities, not like the case we had in 20th century which is more like a linear model. We need to challenge this change with people of all ages and all the sectors. In this context, the role of a university is very important – we have a very deep and strong human network. That is a reason why this kind of action like FSI should be the mission of universities.

Jang Yong Suk

Thanks for your great talk. I am kind of side kick, so I am going to ask questions when we are running out of it or get bored. It's a great initiative that you suggested. I mean it's a new role played by universities and also a new vision for the society, and the new platform for making this world better. Academia can play an important role in that initiative, which is great. I think quite a few universities in Korea are sharing that vision, too. But we all are struggling anyway. Academia is such a conservative space, it's hard to make people persuaded. So, we'd like to hear more about how you persuaded your stakeholders, community members, staffs of UTokyo and make them understand the philosophy and basic principles? What type of incentives did you offer? What kinds of difficulties were there?

Makoto Gonokami

To do this kind of reform, it's important to share the vision with stakeholders, in particular with colleagues and university members – professors.

Hyeon Taeghwan

They are really conservative and stubborn.

Makoto Gonokami

Yes. One of the most conservative sectors in every country. But anyway, the idea towards a future society or to make our capitalist society a better place was commonly in minds of all the members. Of course, incentives are very important. To make the incentive in a simple way, we

changed the budget allocation system. Before, we had a rather traditional system – all the schools and individuals had their individual budget amount as mentioned by the president. They did not know the amount of the budget others have. We changed the law to open everything. All the members now can recognize how much money comes to the school of engineering. And we assured that the total amount of the budget was slightly increased.

But 30% of the budget should be proposal-based – competitive ones. The point is that they need to propose their action linked to our university vision 2020.

Hyeon Taeghwan

So before, basically the budget was equally distributed to different departments. But now you have a sort of power to control the amount of the budget for implementing that vision of FSI.

Makoto Gonokami

Yes, the previous system was that the amount of the budget for each department was based on budget plan in 2004, and then incorporatization started. We had 1% reduction every year, but the amount and ratio were sustained. I changed this point, which was very helpful.

Jang Yong Suk

May I ask one more question then? It's good that you have a budgetary allocation system to motivate people. Still, the first step to solve social problems is to redefine them. How would you encourage your people, students and faculty members, to look for social problems?

Makoto Gonokami

The most important sector part of universities is students. I recognized that the mindset of students has shifted greatly in these few years. Probably, a part of the reason is the earthquake in 2011. It had a lot of impact on students in the age of junior high school and so on. Media reported on the severe damage every day. Many young people became very much willing to challenge and solve social issues by joining social internship programs outside, etc. Some of them are willing to start the new company, especially venture companies that show solutions. They harmonized actions to solve social issues. These two trends were very helpful in assisting this strategy.

Also, many of the young faculties had a similar trend.

Hyeon Taeghwan

Listening to your answers, I became curious. As a president of the UTokyo, do you encourage professors, especially those in engineering, natural science and even medical school to start new venture companies of their own? Because it might take away their time for education and research. What is your opinion about it?

Makoto Gonokami

Of course, not all the professors can be like that. I noticed that the number of professors who are willing to join this kind of action is increasing very rapidly.

Hyeon Taeghwan

Even famous entrepreneurs like Steve Jobs escaped from the school at the beginning and established companies, right? In SNU, professors seldom start their own business, which is a sharp contrast to those in science-engineering universities like KAIST or POSTEC. How would you compare faculty members and students of engineering schools like KALTEC and UTokyo?

Makoto Gonokami

Among my career as a professor, 22 years were spent in the school of engineering. It was only 2010 that I came back to my original base – the school of science.

Hyeon Taeghwan

You used to be a professor in physics, right?

Makoto Gonokami

I majored in physics, but I got my faculty position in the school of engineering. So, I met many young students in both departments. But I didn't see clear difference in mindset between them. The way of thinking, however, is much different.

Hyeon Taeghwan

And vocabularies they use are very different.

Makoto Gonokami

Then I came back to the physics department in 2010 and met many ambitious students who are willing to do both basic science and industrial application. No barriers between them.

Hyeon Taeghwan

Let me switch the gear and talk about different topics. To be successful in initiatives like FSI, one of the most important things is collaboration. A single professor, department or science sector cannot account for this kind of big vision. In order to do that, what's critical is an interdisciplinary collaboration.

Let's start with the multidisciplinary collaboration of lower level. I'd like to share the last 20 years' experience of mine in Seoul National University. Like you, I got all my degrees in chemistry department. And somehow, I got a job in chemical engineering, and I am still in the department of chemical engineering. Recently, I got interested in medicine, too. A lot of my research is really collaborative – all my papers published in the last 10 years are actually through close collaboration between me, science engineering and medical science. Doctors in medical school are involved in them. What's the multidisciplinary collaboration in the Utokyo like?

Makoto Gonokami

Cutting-edge science has already become interdisciplinary in the last two to three decades. As a result, I met many professors in outside conferences. If we attend these top-class meetings, many university colleagues whom I have never met in our campus are there, or even in discipline-oriented academic meetings in Japan. Research itself has already become interdisciplinary. That is why we need to make a platform where all those professors can meet inside campus. That is

the new system I started – so-called integrated research system where interdisciplinary research can be started more easily. So, we asked all the graduate schools to join the new institute which they will be responsible for funding and securing positions. With this scheme, it is very easy to start up the new collaboration platform.

Hyeon Taeghwan

Does the funding come from FSI?

Makoto Gonokami

We have both ways. At the moment, however, we do not have enough direct budget for FSI. But by diversifying our funding, we could deliver more in the future.

Hyeon Taeghwan

How about someone brings the large amount of funding, and then the university or FSI provides matching fund? It might give them larger amount of resources and be more efficient. It's kind of incentive.

Makoto Gonokami

The good point of FSI is that it's an organization directly connected to the president. We have a very flexible operation system. Huge amount of funding from outside Japan is managed by the head quarter, so it's very efficient under this FSI scheme.

Jang Yong Suk

You mentioned that these projects are mostly research collaboration between disciplines. It's critical to understand how these projects are related to students' activities because like you mentioned, the two important aspects of FSI is interdisciplinary collaboration and talents. I have a couple of questions about talent and will move on to larger-scale collaboration issues very quickly.

How would you encourage students to be part of these 184 projects?

Makoto Gonokami

Those projects are already ongoing in our university, and each project already involves many students like internship program. Actually, in science or technology field, graduate school students are inevitable resource for research. So, the students are automatically involved. But some of topics like future and artificial intelligence, we have to launch new courses for the undergraduate students to collaborate with FSI projects.

Hyeon Taeghwan

But starting new course is not easy, right? Frontier areas like FSI have no textbook. Professor himself or herself should make a new textbook out of that. It's a really challenging task. Do you give any incentive or motivation to these professors who start new coursework specifically targeting FSI?

Makoto Gonokami

As a president, I need to pick this kind of activities and help. We already have lots of seeds. For example, regarding data science, professors are already starting new type of lectures.

Jang Yong Suk

Since you talked about teaching, in order to make these collaborative works happen, you probably wanted to change the way of teaching, or pedagogy. Do you encourage things like flip learning or any new ways of teaching method?

Makoto Gonokami

Changing teaching style is a general issue faced by universities from all around the world. Due to development of new technologies, we have new technologies and teaching methodologies including MOOC, so we can easily make things like video lecture materials. Some professors are very interested in and willing to change teaching styles, and support and share this kind of new ideas and methods. That's the stage we are currently in.

Jang Yong Suk

Since we talked about FSI in general and some detailed ways for collaboration, I would like to ask broader level collaboration. I liked that diagram with three circles which suggests that the innovation comes with social system as well as economic activities. You probably need a lot of other types of social actors than university – government, NGOs, sometimes corporations as you

suggest. I was curious how your university is offering the platform for that kind of process. Is there any particular example, or systemic way of helping these collaborations?

Makoto Gonokami

We are not at the stage of building up this kind of platform for many people from different sectors. For example, we already showed people from industry education programs related to SDGs. Many companies are interested in achieving SDGs in relation to ESG. They are very much interested in learning from universities. By visualizing our 180 ongoing projects, it was rather easy to show the outcomes of educational activities. We're now preparing this kind of setup.

Jang Yong Suk

Do you see any changing trends of companies' donation especially targeting this project? Or, when they give funding for your institute, do they clarify that they need those kinds of aims and goals?

Makoto Gonokami

Our scheme to connect SDGs and ESG is helpful for companies to explain their investment in universities in front of stakeholders. I think this kind of mechanism may work and we already have good friends and increase in collaborations – not only person to person collaboration, but also at organization to company level.

Jang Yong Suk

Shall we move on to the role of universities? In a broader sense, although universities perform their duty as a central venue of providing fundamental knowledge and skillsets, we are aware that college enrollment ratio in Japan is not over 60%. The rate is decreasing in Korea, too. Under this circumstance of decreasing fundamental demand from society, what kind of contribution (by universities) would you suggest? Universities may go beyond education but the fundamental function of universities is shaky now. What kind of roles can we plan? Please give us some recommendation and how to prepare for and react to this kind of dilemma in Korea and Japan?

Makoto Gonokami

As I mentioned, we really are in the era of change. So, we need to change our mindsets everywhere. In the 20th century, we had a clear roadmap for economic growth. So how to manage or organize education system was clear, too. But now, we have to be prepared for every kind of change. The important thing is that, the university system we already have is the asset from the 20th century. We need to evaluate the real value of it as an asset from the 20th century society and economy. I know that we have lots of various assets inside universities. We are now having paradigm shift – value is shifting from materials and objects to knowledge or information. Knowledge and information accumulate in universities, which is the most important place for this new economic system. We have lots of assets and infrastructure. For example, we have a lot of communication networks with high level official which is useful for academic research, and that can be used for future society, or Society 5.0, if many people want to get access to data in higher capacity, which universities already own. We can release these assets to all the people to encourage new type of business. That's the role we should create in universities. We do not necessarily stick to the reduction of students. This is an optimistic opinion as a president.

Jang Yong Suk

This is my last question. It's related to the previous question on the role of universities. According to your presentation and your answer now, there is less value in defining the role of universities in terms of conventional components like education and research service. We have defined our role in that way and are also evaluated based on these criteria. Modern universities are expected to take more serious responsibilities like making more impact on local community and global society, brining positive changes by expanding the level of engagement. This is what you are suggesting, right? For this purpose, what facilitating roles are to be played by Japanese or Korean universities? If you have any particular example among 180 projects, that would be even better. But if you don't, you could just show us a process as you imagine.

Makoto Gonokami

Our final goal is to realize a better future society. The question is, what is the better society? Humanity is a very important part in understanding what is better. In that sense, diversity of knowledge for all the humanity is very important. Korea and Japan are advanced countries based on the east-asian culture, and it's also a highly important asset for all the humanity to realize harmonious growth. To strengthen this function, globalization is necessary and crucial to contribute to all the human societies. It is difficult to draw a clear scenario toward a better future, but we need to diversify our learning. Universities are highly unique place with regard to the time scale. Of course, scientists like you are competing academically with each other on a daily (short-term) basis. In a meantime, we also have a long-term learning like history. The important point is that there is no one to one corresponding relation between basic and applied studies, or between short-term to long-term. That is, we also have long-term but application-oriented researches. Think about the forest and trees. It takes 60 to 70 years for tree to grow, and markets

may change, but still they are important. This variety in time scale is very unique one and a very important factor in considering universities' responsibilities.

Hyeon Taeghwan

In this morning, one of my colleagues from the college of medicine in Wisconsin gave a seminar. At the lunch table, I told him that I am going to meet the president of the University of Tokyo. He was also curious about the university system in Japan. Broadly speaking, there are two different kinds of university systems in the world. The first one is like in Japan – hierarchical system. We have one leading, full-time professor, a couple of associate professors, and three to four assistant professors. As far as I understand, that's the system most of Japanese universities and a lot of universities in European countries like Germany and UK have. On the other hand, in the U.S., once you become a professor, every one of them is totally independent. Six or seven years later, they go through tenure system. After passing the tenure, they can be promoted to the associate professor with tenure and stay. So, there are Japanese system and American system. There are pros and cons. For most of scientists in Korea including me, the first week of October is a terrible time, because Nobel physics laureate is announced on the Monday of the first week of that month, and Nobel prize in physiology and medicine on Tuesday and chemistry on Wednesday, the worst day for me. I was mentally tortured this year too. We envy Japanese scientists because this year, again, you produced one Nobel laureate in science. Lots of people assume that the hierarchical university system is one of the reasons. On the other hand, young professors are working as assistant professors for higher-level professors. I think that might kill their creativity or power to sustain by himself or herself. Could you tell us more about this kind of system?

Makoto Gonokami

My field is optical science and as you can see, in the list of Nobel laureates in this century, there are so many optical scientists. Many of them are my friends and I have collaborated with some of them. In Japan, we have a mixed system. We have traditional, European-style "big" professors, but we also have American-style system.

Hyeon Taeghwan

The University of Tokyo did an experiment with American style in one of the campus, right?

Makoto Gonokami

In the school of science, chemistry department keeps the traditional style. But in physics department, each professor is highly independent.

Hyeon Taeghwan

When did they change so?

Makoto Gonokami

Since 1970s or something like that. When I was an associate professor, the independent system was good. But when I became full-time professor, it wasn't. (laughter) Depending on the research situation, international competition is so severe that they really need a big group. There are some subjects that need such groups, which is why we need more flexible system. It is also important to give a chance to young and capable people. Looking back 1980s and 1990s when

most of Nobel laureates were doing important work, major difference is that we had more time. In terms of money, now is much better. But we had much more time for discussion, experiment, communication with students and professors back then. Now, professors seem too busy. That will be a serious problem for future science and technology.

Hyeon Taeghwan

Looking back early 1900s, general chemistry or physics textbooks had single subject in a single page. But this has changed quite rapidly. Now, collaboration between different disciplines is not optional. It's MUST. Without collaborating with different disciplines, dealing with "big" science or technology is impossible.

There are several questions from the floor. Let's start with the question from Iwon Kim. As to university presidents in Korea, most of them are from business, economics, social science, etc. But your field is physics. And your initial career was in engineering and now a professor in natural science. As a president from natural science/engineering field, how do you see your difference from presidents in the field of social science? What is the strength and weakness as a president with the background in science?

Makoto Gonokami

I don't think there's much difference coming from background. But in my career as a physicist and working experience in the school of engineering, I had a lot of chances to organize some good projects. We need a lot of skills for management. First, we need to prepare a good proposal to get money, we have to manage this money more effectively. We also need to attract people from both inside and outside of the group. This kind of training and experience is helpful for working as a president, because these days, we need to consider more about budget. Professors

from humanity department, I am not quite sure. It depends on each professor. It's more likely that professors from science and technology have chances for such experience.

Hyeon Taeghwan

Being a president of the university of Tokyo must be a really challenging job. Some former SNU presidents once told me that there are three thousand presidents in SNU. That is, all the professors are like presidents in SNU. Professors in humanity and social science especially have a large voice. When they've got a problem, they just evade president's office. Every professor tries to say something and complain. Your job must not be easy, too.

Makoto Gonokami

From my three years and a half term as a president, I learned that one of the most important jobs of mine is listening, persuasion and explanation. When I made the vision of UTokyo 2020, I visited all the 26 faculty meetings. It took three months. After three years, I did the second round of it, which also took three months. It was to explain the progress and why we are doing such things. That was very helpful. And it was very enjoyable for me, because by visiting each faculty, I can see if they are active or not. Fortunately, I still keep my research group activities. Every week, I spend two hours with my students.

Hyeon Taeghwan

If you are successful in persuading UTokyo professors, I think you can do anything. I guess the rest of the world is much easier. I think our audience has raised similar questions that we already discussed. One of them is, 'how are you going to encourage young professors and graduate

students to participate in your FSI?' We already discussed it, but if you have more things to talk about…?

Makoto Gonokami

We recently started a new program to encourage startup by newly tenured professors, those in their 30 to early 40. We give them some seed money without requiring any proposal or report. We selected 20 new professors for two years, and already have 41. We ask them to gather and discuss to enhance and encourage interdisciplinary collaboration.

Hyeon Taeghwan

This is the last question. This might be a little bit tricky for you. Recently, I visited China quite often. There were a lot of collaborations going on. One of the issues for Chinese universities as well as for Korean and Japanese universities is globalization. I don't know whether you care about the rankings or not, there are a lot of rankings for universities and each department, right? SNU is very weak ant globalization. What is your thought about international collaboration with regard to FSI, and collaboration between Korea and Japan in particular?

Makoto Gonokami

As I mentioned, international collaboration is very important. Especially Korea and Japan cooperation is important. Our aim is to provide east-asian culture or learning to the world and share them to all the humanities. That kind of contribution to the world is critical. As to rankings, the point is that they want to make our world more flat and diversified. In that sense, diversity is

important for the ultimately sustainable world. Our cooperation is very important for mutual understanding. That will be the base for future globalization.

Hyeon Taeghwan

When it comes to globalization, issues are like – the number of foreign students, foreign faculty members, and so on. You have a little bit different angle into this issue, right?

Makoto Gonokami

Yes. Those indices should not be our goal. We need to share clear goals.

Hyeon Taeghwan

Numbers don't take much time. Just a few seconds with Excel, and you can come up with them. But for news media, numbers matter. So, I think diversification and the true globalization is hindered by such things and those ranking system. I fully agree with you in that point.