

# Higher Education in the Age of Great Transformations

## ■ Teruo Fujii

President, University of Tokyo

First of all, it is my great pleasure to participate in this Beijing Forum to discuss this very important and interesting topic, which is AI and higher education. I'm Teruo Fujii, President of the University of Tokyo. I'd like to thank the organizers for giving me this chance. I am deeply honored to join here as one of the speakers. Today I would like to talk about what we are doing in terms of the new ways of higher education in the age of this great transformation. The transformation includes all the different global issues that we are facing now.

When I took the Office of President in April 2021, I thought that economic and materialistic development alone is not enough to increase human prosperity and well-being. In this situation, what role of the University should play? This is an important issue that I needed to think about.

Then I discussed intensively the new guiding principle of the University of Tokyo with our executive members. We released UTokyo Compass in September 2021, which is a new guiding principle. The title is "Into a Sea of Diversity: Creating the Future through Dialogue."

We basically set three core values. The first one is "dialogue". We are the university, where we create new knowledge. Then through dialogue internally and also as well as dialogue with the people outside of the university, we need to share the created knowledge and also, we can co-create knowledge. This is a very important practice of the university, and through

such kind of dialogue, if we could come up with new clues or milestones that are able to overcome difficult problems that we face, that is one of the ways for the university to serve the global public.

It is also very important to appreciate “diversity and inclusion”. Dialogue with people from diverse backgrounds and discussion from diverse viewpoints are very important for us to make a higher level of academic achievement, as well as to come up with a kind of solution to social issues that has a common agreement.

Then, we also would like to make our university a better place where anyone in the world would like to join. Those three are the very basic concepts of this UTokyo compass, and based on this guiding principle we are doing many different types of activities for higher education.

Next, I would like to raise a couple of background caused by the great transformation. The first one is an increase in the data traffic in society caused by the introduction of digital technologies into our daily lives or business operations. As this slide shows, internet traffic has already doubled from 15 terabits per second before COVID-19 to 30 terabits per second after COVID-19.

This means that we need to see the Paradigm shift. The source of the values used to be a product or goods manufactured by heavy industries or car automobile companies, but now the Paradigm itself is gradually shifting into data, service, or those kinds of experiences. The goods are more like the tools to connect ourselves to data, service, or experience. In this transformation, we also need to think about how to achieve the necessary expertise.

We basically need to escape from the old linear model. We need to rescale ourselves or have lifelong learning opportunities. For example, UTokyo established a subsidiary company, "UTokyo Extension", that provides Data Science Education. They are running a data science school and the number of students is doubled every year. Now, over a thousand students are taking this course.

Another aspect we need to be aware of is the importance of design, art, or liberal arts besides the expertise in STEM areas. It's not good to see only data or technology, and you

need to see all the background information behind the data. In order to think about applying technologies to society, we definitely need those types of education. Especially, there are so many discussions over generative AI, and in that aspect, we also need to think about the background information of data.

For that purpose, we are offering the Design Academy as a lifelong learning course in Tokyo in collaboration with the Mori building, Mori Memorial Foundation, and together with Royal College of Art. This is more for people from companies, and they are taking courses in the city center area to learn about design thinking and creativity.

Next, I would like to pick up some points that we want to discuss in the frame of this higher education in the age of great transformation by the emergence of Chat GPT or generative AI. It's a time of great transformation and we need an immediate response to this situation. This is a quote from my speech at the matriculation ceremony which was held in April, and I quoted the sentence from President Joseph Aouns' book. He wrote this book in 2017 and talked about higher education in the age of artificial intelligence. Then he explained how higher education should be in the age of this advanced AI and Robotics technology. For the student, it is so important to have more experience in a real situation of business or manufacturing. Experiential learning is very important as a foundation for nurturing students' creativity. We also should keep in mind to discuss higher education in this kind of situation.

This slide shows how students and professors at the University of Tokyo are embedding a generative AI into their classrooms. They are just a couple of examples, but for example, they are basically taking a rather analytical approach to see how this chat GPT is generating their answers, and then what would be the kind of relevancy of those answers. In the first case, the students' group discussion is shared with the Chat GPT so they can have a look at their outputs. Chat GPT will make a kind of different viewpoint besides the students' viewpoints. It can generate a diversity of points of view in a classroom and Chat GPT plays a role as compensation if the number of students is small. Then more answers are generated from diverse viewpoints and that provides a kind of new perspective that students are not aware of.

Another example is letting students use Chat GPT to work on their assignments. Students should basically keep all the conversations with Chat GPT so that they can have a look at how they respond or how the Chat GPT is responding to the questions. In this way, it is so important for students to see what kind of prompting will make our answer made by Chat GPT. Currently, we are letting our students take an analytical approach in the classrooms.

Next, I would like to point out that there's a fundamental question that we need to look into AI technology as an academic institution. So far, there are quite a few discussions on a kind of threat made by AI or robotics. For example, in the book "MIND Children" written by Prof. Hans Moravec of Carnegie Mellon University, he talks about the post-biological world and argues that robots or machines are somehow taking over a biological entity, or even sharing the Earth together with the biological entity. That is one idea, and as you know the singularity is another very big discussion raised. Prof. Geoffrey Hinton is talking about existential threat to human beings. He points out the kind of scary future of the Chat GPT. Compared to our brain, very few parameters make kind of very good representation of intelligence. In this way, there are still quite a few discussions that we need to show to society what is exactly the threat or what will happen when we face such kind of a very big transformation.

And this is just a summary, but besides these interesting topics, we also can think about science acceleration by the generative AI or machine learning itself. We also need to discuss the energy issues. When we think about the future of our work, more efficient and productive use of this generative AI should be also discussed. Another point is that Chat GPT is a large-scale language model, so there might be some concern about equitable development or access. On the other side, we may be able to use this kind of technology to prevent native languages from extinction.