Title	Challenging myself to new fields in all seriousness led to establishing my researcher career : Associate Professor Yasuhiro Kakinuma
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Associate Professor Yasuhiro Kakinuma

Challenging myself to new fields in all seriousness led to establishing my researcher career

Wishing to become a medical doctor like his father, Dr. Kakinuma took up the challenge of an entrance exam for a national university medical department in vain. He says that the first three years of his campus life at Keio (which was not his first choice) was somewhat purposeless, but joining a lab as a senior awakened his interest in the excitement of research. What underlies his subsequent smooth and successful path of researcher life despite his initial bitter experience seems to be his sincere attitude in addressing any challenges with all his energy.

What was your childhood like?

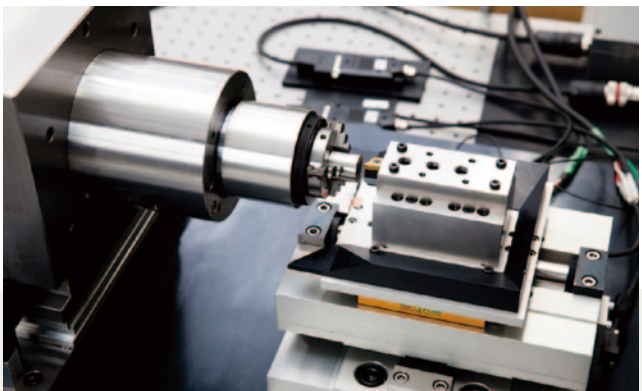
From kindergarten through senior high school, I was studying at Seijo Gakuen, a private educational institute adopting a consistent education system similar to Keio Gijuku. The education at Seijo Gakuen was unique; particularly its elementary school emphasized learning from nature and encouraged studying science and mathematics experientially, leading children to touch and feel actual objects. Not only did the school educate children through books, but also more importantly led them to have questions about things and think about "Why so?" For example, its curriculum included a unique two-hour-straight program known as "Stroll Time" – an opportunity for children to take plants and insects in their hands and learn from nature while strolling outside the school.

To tell you the truth, all the subjects – EXCEPT the five core subjects – in my report card were "E" (Laughter)! Looking back at my Seijo Gakuen school life, the experiences I gained as a schoolboy turned out to be a great asset for me to acquire a sense required of a researcher specializing in manufacturing technology.

Did you aim to become an engineering researcher from the very beginning?

No. My father was a university hospital doctor, whose back I had always being looking at. So it had been my dream, vague though, up to the junior high school days, to become a medical doctor like my father. Since Seijo University didn't have a faculty of medicine, I had to take an entrance exam for a university with a faculty of medicine. In those days, the university I had in mind was a national university.

But I failed the national university entrance exams even after spending a gap year. So I decided to switch to the second choice – Keio University Faculty of Science and Technology. There were a couple of reasons for this choice: I liked to mess around with things mechanical since childhood, and physics was my favorite subject as a senior high school student. If I put it in terms of positive thinking, the failure in the national university entrance exams might have been the due course of my life after all. I can say this because I was eventually able to choose and follow the course of life most suitable for me.



Given my interest in interdisciplinary fusion studies, it was particularly the right decision that I chose the Department of System Design Engineering.

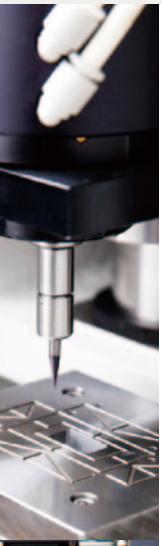
How did you spend your campus life?

Honestly speaking, I was a somewhat cynical student as a freshman and sophomore. In fact, my motivation of life was low and my life then was a purposeless one due mainly to failing the entrance exam for the faculty of medicine. So I attended only the classes of my favorite subjects; otherwise I used to kill time at the tennis circle and by working as a private tutor as a sideline.

A turnaround in my motivation came when, as a senior, I joined Professor Tojiro Aoyama's (currently Dean of the faculty) lab. I awoke to the excitement of shedding light on various phenomena as I conducted experiments while coming to find enjoyment as well as difficulty in giving concrete shape to my ideas.

That said, in those days I had just begun to study electro-rheological gels (the forerunner of electro-adhesive gels) and couldn't achieve any tangible results. I was shocked indeed by the gap between the armchair theory and reality. Despite that, I had to proceed with the challenge of seemingly answerless questions by finding problems by myself and probing for ways of solving them on my own. It was a delightfully exciting experience, but at the same time I took it to heart that a researcher's career was such a painstaking one.

So, when I went on to the master's course, I complained to Prof. Aoyama and asked him for permission to change my research theme. But his advice was simple: "Patience is the key to success in research." Consequently, I decided to focus on this material throughout the master's course. In the initial stage of research, my major theme was application of the material. In the course of time, however, I proposed to Prof. Aoyama that basic research for developing the material itself would be indispensable. This time, the broad-minded Aoyama-sensei accepted my appeal agreeably. Now highly motivated, I devoted myself to research, which led to the successful development of a new functional material in the second summer of my master's course. I applied for a patent for this development together with my joint research partner. This success naturally made me think that parting with this project at



this stage would be a waste, urging me to lead it to the next step for application research. Up to this moment, finding employment with a private company had been an option for my future life, but I decided to go on to the doctor's course.

You mean you made up your mind to choose a researcher's career just at that stage?

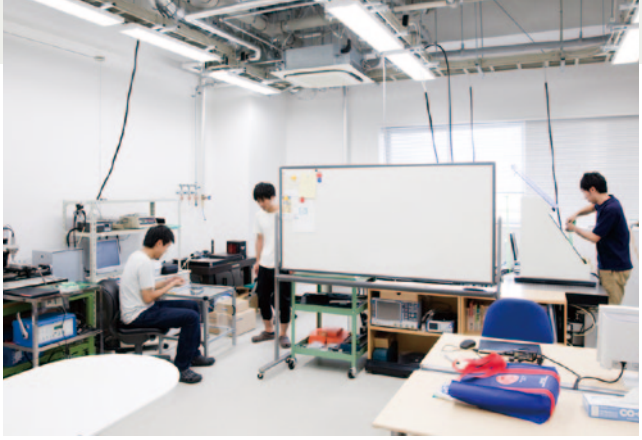
Well, I decided to enter into that career not only on my own initiative but also thanks to Professor Aoyama's advice. When I consulted with my parents on this matter for, they gave me their wholehearted support. More importantly, I myself was determined to follow the path of my own choosing. In this connection, Keio University made a decision to adopt me as a research assistant for the Department of System Design Engineering in 2005, the second year of my doctoral study. Adoption of a research assistant while he/she is still in the doctor's course was a rarity, which renewed my motivation to emerge as the top-notch researcher in this field.

Also eager to meet the expectations of the people around me, I desperately devoted myself to studies and earned a doctor's degree in two years. I was promoted in rapid succession to assistant professor in 2008 and to the current position as associate professor in 2011.

Incidentally, Professor Aoyama was very generous. When I asked for his permission to join the seminar of Professor Kouhei Ohnishi (the authority of control technology) as the next step to materials study, he readily agreed. Back in those days (when I was a doctoral course student), I was lucky enough to meet Associate Professor Seiichiro Katsura (then a doctoral course student like myself), who was a member of the Ohnishi lab. Working with Dr. Katsura in a joint research project concerning accurate positioning for linear motor stage was a rewarding experience, which is still a great asset for me. It's an interesting coincidence that both of us are now serving as associate professors at the Department of System Design Engineering (Laughter). I became well versed in both production engineering and control engineering thanks to the encounter with Dr. Katsura and having worked with him in a joint research, which is now my great strength as a researcher.

How many students presently belong to the Kakinuma lab?

One in the doctoral course, nine in the master's course and six undergraduate students – 16 students in total. If members of the



Aoyama lab, who learn at the same seminar as the Kakinuma lab, are included, the combined force comes to 28 in total. This seminar seems well balanced due to the presence of the well-experienced Professor Aoyama and myself whose age is close to the students'. The Aoyama/Kakinuma lab has a very good atmosphere. "Be serious both in research and play" – this is our lab's motto. What makes our lab comfortable and productive is that all of our lab members are friendly with each other and unified.

How are you spending your free time?

I have three children. I relax by viewing animations and playing with them. Having said that, my headache is that I actually have a pile of things to do as a researcher, which interferes with my happy time with the family, you know (Laughter).

◎ Some words from students . . . ◎

● Maybe because his age is close to ours, Dr. Kakinuma always takes good care of us, ready to give warm advice. What's more, his advice looks ahead into the future and accurately indicates the course our research should follow, which is truly reassuring. All our lab members are very friendly with each other, so it's no exaggeration that we come to the lab just because it's a pleasant place to be in. No wonder we can devote ourselves to anything – in study or play.

(Reporter & text writer : Madoka Tainaka)

For the full text of this interview
http://www.st.keio.ac.jp/kyurizukai

Vitally important are aspiration and curiosity. Because aspiration leads to opportunities and curiosity is the source of new discoveries and inventions.

Yasuhiro Kakinuma

Dr. Kakinuma's specialties are nano/micro-machining and intelligent machine tools. His current research themes are analysis of phenomena for nano-scale cutting and intelligent machine based on the observer theory. His activity ranges widely from fundamental studies to applied research into fusion of mechanical and control technologies. He obtained a doctorate (Eng.) in 2006. After becoming a research assistant for the Department of System Design Engineering of Keio University Faculty of Science and Technology in 2005, he was promoted to assistant professor in 2008, then to the current position as associate professor in 2011.