

japan times forum on english education

Engineers must have English skills to succeed

With the continuing trend of economic interdependence prevailing on a global scale, Japan is increasingly interwoven with the rest of the world on many fronts. Overseas production of goods for Japanese companies has been steadily growing during the past few decades while the number of non-Japanese nationals working in Japan has reached nearly half a million, or close to 1 percent of the total workforce, as of October 2008.

Against this backdrop, it is becoming inevitable for Japanese researchers and engineers to communicate directly with non-Japanese people, not only their counterparts but also businesspeople, customers and even government officials. In reality, however, their communication ability in English, the de facto international language in business, is far from meeting demand. Despite the remarkable achievements in science and technology in recent years, highlighted by the granting of several Nobel Prizes and significant breakthroughs made in laser optics and iPS cells (induced pluripotent stem cells), Japanese researchers and engineers are considered by and large not competent enough in English communication skills.

In an attempt to identify real problems Japanese researchers and engineers are faced with in English communication, and hopefully to offer some hints to their solutions, The Japan Times brought together four noted figures engaged in English education for researchers and engineers.

They were Michihiro Hirai, a language education consultant and freelance translator as well as a lecturer of technical English at Kanagawa University and Waseda University; Masaharu Hiraga, a former adviser to Sanden Corporation; Laurence Anthony, a professor at the Faculty of Science and Engineering at Waseda University; and Atsuko Yamazaki, a professor at Shibaura Institute of Technology. Masafumi Otsuka, the CEO of MANABI Ltd., served as moderator.

Their discussions follow:

Moderator: Can you tell us how the recent economic changes have affected Japanese researchers and engineers who use English in their jobs?

Michihiro Hirai: I was with Hitachi from 1965 to 2002. During this time, I witnessed many changes in the roles of people being sent overseas. Back in the '70s and '80s, Japanese companies mostly exported their products, so it was mainly the service and support engineers who needed to communicate in English. This role drastically changed during the '90s, when companies started producing their products overseas. More and more Japanese engineers who worked in manufacturing were sent overseas to oversee the new production sites while the design and development departments still remained in Japan. But due to the burst in globalization, product design and development have begun to move overseas as well. Now, engineers have to talk directly to foreign customers, work closely with the sales and marketing people, and often times negotiate with people inside and outside the firm.

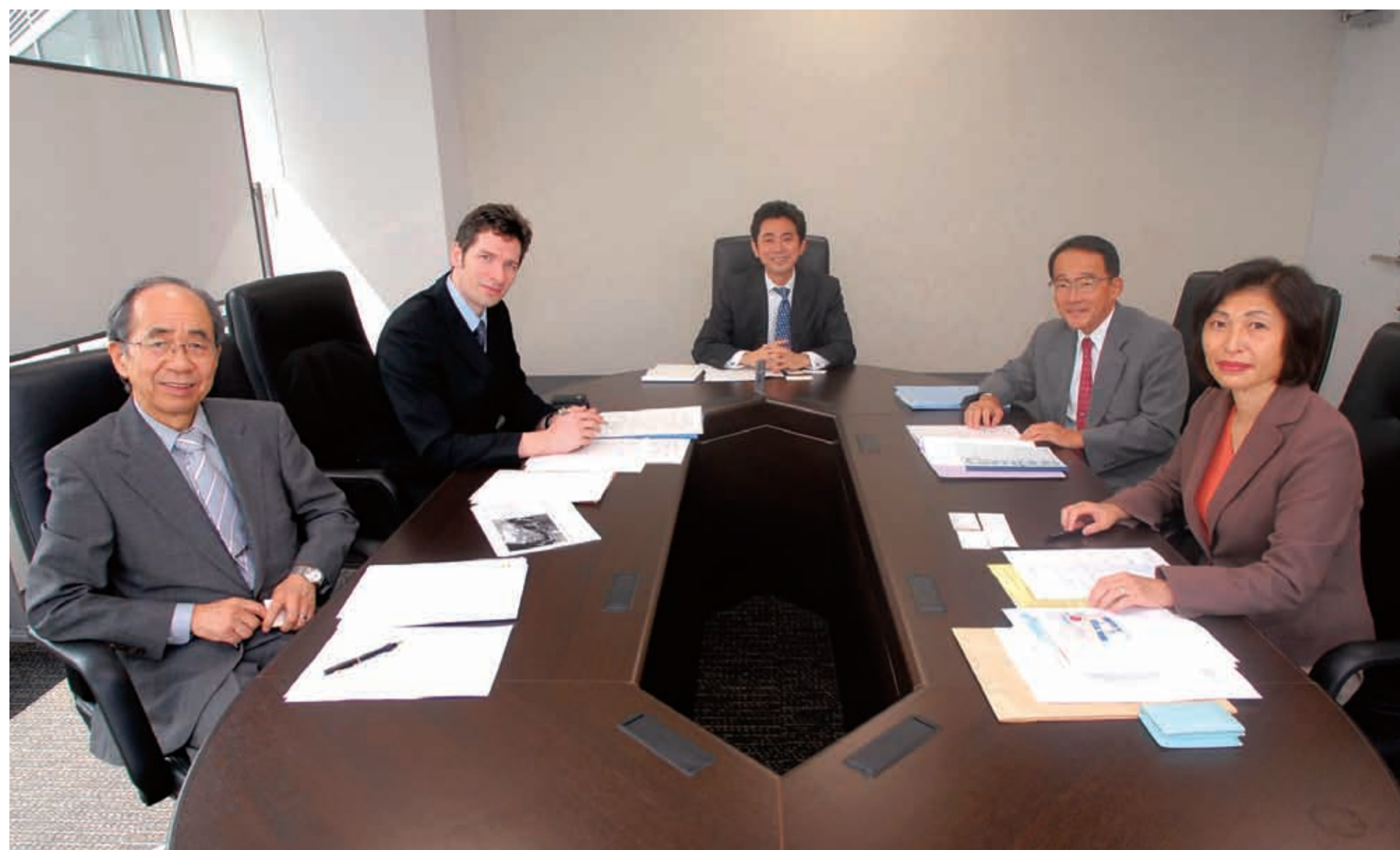
Atsuko Yamazaki: I visited factories operated by Japanese manufacturers in Southeast Asia and the United States and found exactly what Mr. Hirai just stated. The Japanese managers were

responsible for transferring a certain technology into a new production site and had to do everything by themselves from scratch. Considering the complexity of the work and the time constraint, there wasn't the option of hiring an interpreter. The role of Japanese engineers is drastically changing from solely engineering to managing, discussing and negotiating with various professionals.

'There is a huge gap in what corporations want and what the current education system provides. Current English education in Japan focuses too much on passive skills: reading and listening. But the demand in the real world is active skills: speaking and writing. I'm afraid this gap largely stems from the overdependence on the TOEIC test as the sole indicator of English skills both in industry and academia.'

Also, due to regulations in some developing countries, some countries require foreign companies to incorporate locally and hire local CEOs. Many group leaders at engineering sites are also non-Japanese. So there is a growing need for Japanese engineers living in Japan to communicate with non-Japanese workers abroad.

Masaharu Hiraga: In the past, the major R&D centers were in Japan, so



Expert panel: Professionals at the forefront of Japan's education of English to researchers and engineers get together recently for a Japan Times round-table discussion. They are (clockwise from left) Masaharu Hiraga, an ex-adviser to Sanden Corp.; Laurence Anthony, a professor at Waseda University; moderator Masafumi Otsuka, CEO of MANABI Ltd.; Michihiro Hirai, a language-education consultant; and Atsuko Yamazaki, a professor at the Shibaura Institute of Technology. YOSHIAKI MIURA

engineers directly went abroad to sell their core technologies to clients. But now R&D centers are scattered around the world in order to fulfill each market's needs. And now, non-Japanese engineers are at the forefront of dealing directly with clients. So Japanese engineers must communicate with these non-Japanese engineers. The interesting part is that the majority of the non-

nuances of messages they receive.

Laurence Anthony: Another factor is the trend toward outsourcing. In his book "The World is Flat," Thomas Friedman explains how countries are beginning to outsource their noncore IT/engineering tasks to firms in places like India and China. You can see this in Japan, too, where, for example, more and more firms are now outsourcing

ample jobs for engineers at the levels from the top to the middle that normally require relatively high-level language capability and even for the production line engineers, who now use only a minimal vocabulary at best when communicating, such as on line operation standards. The majority of those engineers are at the risk of losing their jobs. When I was working for companies in a group,

skills," according to a 2008 study conducted by Ikuo Koike, an honorary professor at Meikai University, and his group as a Grants-in-Aid for Scientific Research project. Also, when asked, "Which English skill drastically needs to be improved in the coming decade?" over 73 percent of the respondents pointed to "listening and speaking skills." Finally, when asked about their desires for college English education, over 70 percent replied that they wanted universities to teach practical language skills that can be used from day one.

There is a huge gap in what corporations want and what the current education system provides. Current English education in Japan focuses too much on passive skills: reading and listening. But the demand in the real world is productive skills: speaking and writing. I'm afraid this gap largely stems from the overdependence on the TOEIC test as the sole indicator of English skills both in industry and academia. While TOEIC is in itself a handy and perhaps good passive skills test, I am very concerned about the way it is used in Japan today: People mindlessly use it beyond the scope it is originally designed to test. As a result, productive skills training, which is crucial to fostering Japan's competitiveness, is greatly neglected.

Anthony: I don't think TOEIC is a bad test. The problem is how we use it. Companies say that they need people with productive English skills, but they are only using the TOEIC score to measure these skills. The TOEIC is very convenient since it's easy to take and gives a numerical score so progression can be tracked easily. As a result, most companies require students to put their TOEIC score on their resumes. But TOEIC only measures general proficiency. There is a huge discrepancy here. The need for productive English skills changes into a need to improve TOEIC English. And to fulfill these needs, universities are pressured to teach it during class. It's just like a college entrance examination. If that's the goal, people will work hard to achieve only that.

Moderator: Is there any way we can resolve this issue?

Hirai: We need a sort of common framework for English education and evaluation so that people can discuss relevant issues on the same ground. The most important piece of such a framework is a set of "Can Do" statements (statements that describe what language users can typically do with a language at different levels and in different contexts) as advocated in Europe and the U.S. I must add that we need "Can Do" statements not only for general English but also for English for Specific Purposes. **CONTINUED ON PAGE 9**

Japanese engineers are also non-native English speakers. So it becomes even harder to convey delicate nuances. Here, I would dare to say that this situation normally works as an encouraging factor because the barrier the Japanese engineers feel seems lower than when facing native English speakers. Yet still I believe they should aim at the high-level communication with native English speakers who expect to receive

their software development overseas. What was once a business collaboration involving two countries has expanded into one involving multiple countries. And as a result, English has become the common language people use to communicate.

Moderator: Will this trend continue? What will happen 10 years from now?

Yamazaki: I only see this trend accelerating. There is now a "Little India" in Nishi-Kasai (Koto Ward, Tokyo). More and more skilled engineers are coming to Japan. In 2007, I witnessed a Japanese automobile company transferring its CAD (Computer-Aided Design) division to Vietnam. The Vietnamese who took over this job had all graduated from Hanoi University, which is equivalent to Tokyo University. Japanese engineers are pressured to produce outside Japan but must be able to compete with bright foreign engineers in Japan as well. I wonder whether we can maintain our current competitiveness. Also, the latest technical information is written in English. And engineers often solve problems through online communities. To keep up-to-date on what is happening in the technical world, you need to be able to read and write English. This trend will only get stronger.

Anthony: There's also growing pressure for change coming from within Japan. Carlos Ghosn has been leading Nissan for 10 years. Howard Springer is now the CEO of Sony. Even in sports, you can see that Marty Brown is now the manager of the Hiroshima Carp. Globalization is no longer happening only outside of Japan.

Hiraga: Many people think that as long as they are in Japan, they are exempt from using English. This is a big mistake that has never been considered so. Going forward, there should still be



Overseas shift: Local employees work at a factory of a Japanese company in the suburbs of Glasgow, Scotland. As Japanese corporations are stepping up a shift in production to foreign countries, Japanese managers are facing the challenge of communicating in English with their local hires. KYODO

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specific Purposes (ESP). Actually, efforts are under way to create "Can Do" statements for English for engineers in Japan. Furthermore, I understand that some universities (in Japan), including Waseda and Sophia, have created their own "Can Do" statements and have built the whole curriculum around those goals. That's the way it's supposed to be, but unfortunately, they belong to the minority, I'm afraid.

Yamazaki: Also, we have to keep in mind that the needs change as time goes by. For example, business presentation wasn't needed for engineers in the past, but now it is. "Can Do" statements must be aligned with the latest industry needs. We also need some kind of system to measure the progress of "Can Do" statements.

Moderator: What are the obstacles for creating common "Can Do" statements?

Hirai: I think the question is who should authorize "Can Do" statements. My answer would be the government. No matter how much disagreement among the stakeholders exists for reaching a common ground, they will eventually listen to a higher authority. An alternative would be a nongovernmental, neutral organization supported by industry, similar to The Japan Accreditation Board for Engineering Education (JABEE).

Yamazaki: I agree with the idea, but university professors need to be in the loop since they are the ones who will create curricula based on the authorized "Can Do" statements. Also, since "Can Do" statements come directly from the needs of corporations, every party must work closely together. One problem I'm seeing, especially with university English professors, is that they have only a vague idea about what's actually happening in the engineering and manufacturing fields. I've seen only a few research reports written by university English professors about the situations in these fields. But I've rarely seen research reports written about the real world. Academic society needs to reach out to the corporate world more.

Anthony: I think it would be hard for JABEE itself to make this decision since JABEE basically leaves most of the decision making to academic institutions. And since, as Ms. Yamazaki said, English academic institutions are normally closed societies, creating common "Can Do" statements could be quite a challenge. Perhaps the engineering societies might have a stronger role to play.

Hiraga: I think the major industries need to take a leadership role. Currently, I don't see a positive spiral of needs. If corporations explicitly say,



Masaharu Hiraga



Michihiro Hirai



Atsuko Yamazaki



Laurence Anthony



Masafumi Otsuka

"These are the skills that we need for our employees," and come up with some kind of measurement that can be put on students' resumes, universities will follow this lead and build a curriculum around them. Once the curriculum is set, the needs for instructors to teach the curriculum will be determined and the positive spiral begins to function.

Moderator: But why isn't this happening? What expectations do corporations have for university education?

Anthony: I've talked with a lot of students about their job interview process. Surprisingly, many said that corporations didn't seem to be interested in their English abilities.

Hirai: When corporations recruit students fresh out of college, they are looking for people who will become their future top managers, and the best predictor for this is the university's name and reputation. Also, since the notion of lifetime employment still exists, corporations closely look at the people, not the skills they attain.

Hiraga: I find two strong beliefs in corporate recruitment policies: One is that they don't count on university education and two is they don't want smart-aleck people. Corporations believe they can educate their employees from scratch, so they don't want anyone with a predetermined set of beliefs or skills.

Yamazaki: I feel this, too, talking to recruiting managers in corporations. Sometimes, I speak candidly about the skills a particular student lacks, but they don't seem to mind as long as he or she is an honest, hard worker. So, sadly, although we talked about the intense competition due to globalization, the

mind-set of large corporations hasn't changed.

Moderator: Can you tell us about current English education for engineers in universities?

Anthony: Many university engineering professors live in the really small world of their academic profession. So in their research seminars, they say to students, "Here's a research paper that you must read. You translate this part into Japanese and you do this part." The engineering professors want students to focus on reading. And as a result, they naturally want English professors to also emphasize reading in their classes.

Hirai: I've only taught in universities for about six years so I cannot speak with that much experience as to what is happening there, but what I have found there is bad recruiting. For instance, many universities think that working as an engineer in a large global company for many years, and hopefully with a few years' experience abroad, qualifies you as a good instructor of technical English. Of course, the supply of people who can teach English for engineers is extremely scarce, but recruiting should never be taken lightly. The next problem is delegating the creation of the curriculum to that person. When this happens, no one knows what others are teaching. I've seen cases of students using the same textbook two years in a row since the new professor didn't know what the previous professor had taught only one year before.

Anthony: In the field of ESP, I would like to stress that there are almost no professors who, first, have their research papers published in major international research journals; second, have a good foundation knowledge of

science and technology; and third, can teach in the language of their field, which in this case is English. Considering that almost all science and engineering professors have these three skills, you can see that there's a quality issue with the English professors here in Japan. Also, I would like to comment on the textbooks most instructors are using. There is a firm belief that textbooks must all be translated into Japanese to be used in the classroom. But this is not true. I really think we need to change this view.

Yamazaki: You're right. There are some really good engineering textbooks that cover what's going on in the real world. But these are all written in English and these publishers are not marketing the books effectively toward universities. I think as professors, we must start taking the risk of using textbooks without Japanese translations.

Hiraga: Another problem I see is that everything is ad hoc. In 2002, MEXT (Ministry of Education, Culture, Sports, Science and Technology) started a program called Good Practice (GP) to increase the number of Japanese who can use English at a higher level. A large part of the funding was allocated to the science and technology departments of colleges. I took part in this by creating a GP program at Gunma University. This was one of the major programs, but it seemed to end without any serious evaluation or results sharing. I still see English professors confused about how and what to teach their students. This is a huge problem in the system.

Anthony: I agree. I see many, many nonscalable pilot projects. For example, one university temporarily hires a really brilliant person to teach a class, which produces great results. No one knows whether this person will teach again the next year and no one can teach the class the way he does. The problem is that most projects rely heavily on individuals, rather than creating a sustainable system. What we did at Waseda was first design a strong curriculum. Second, we implemented the curriculum across the departments and faculties. Third, we trained the instructors on how to effectively teach the curriculum. Fourth, we evaluated

the program and made adjustments where necessary. And finally, because the program started producing results, we were able to recruit more people, add more space and improve the infrastructure. The Faculty of Science and Engineering at Waseda started this program in 2004 and it has since increased to cover courses for all 10,000 students in both the undergraduate and graduate schools.

Yamazaki: As for finding good instructors, I believe that we need to educate liberal arts majors more efficiently. At Shibaura Institute of Technology, there are 30 part-time English lecturers, but only two have degrees in science and technology. We need to train these people effectively since they are our main source of information. Training and the quality of teaching materials are the two key success factors.

Hiraga: There should still be good potential instructors in the corporate world. If somehow we can figure out a way to ask corporations to sponsor the talent search, it should benefit both the academic and corporate worlds.

Yamazaki: That would be ideal. The problems for universities always come down to funding. Universities cannot allocate a large amount of money for recruiting. It would be great if corporate society could sponsor this search for talent. When I taught at the Institution for Technologists, I used to invite top engineers from prestigious companies like Sony to talk about how important English is as a communication tool in the engineering world. Nothing beats this message since it comes from people students admire. We need to bring more of these people into the academic world.

Moderator: Finally, what advice would you give for reforming English education for engineers?

Anthony: We talked about creating proficiency tests for engineers, but since engineering is so broad, I think that's unrealistic. What we need are gatekeepers, for example, the academic societies that authorize courses and the standards in engineering English in order to put an end to the current ad hoc curriculum design process. Top universities need to create strict criteria that they follow

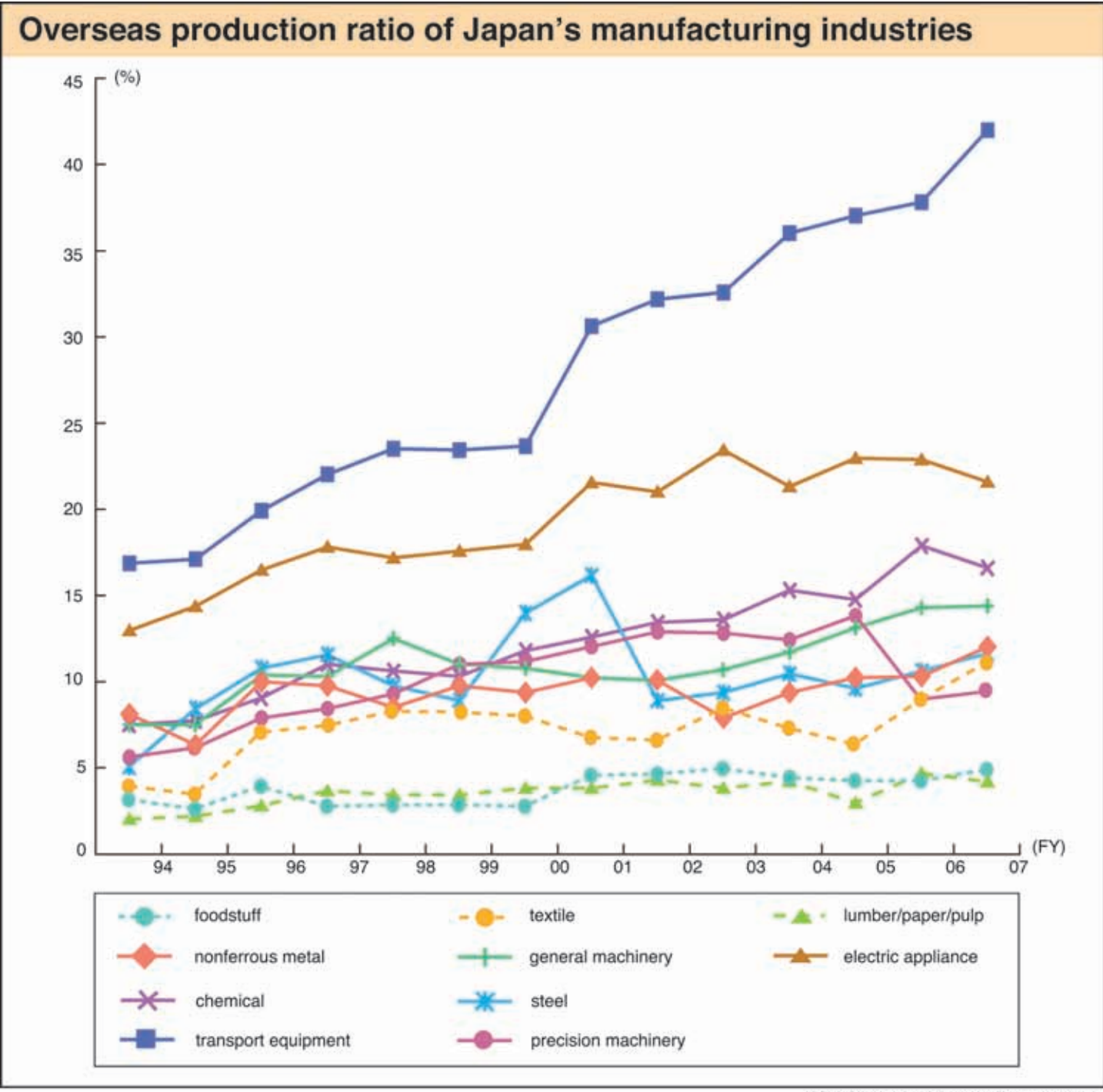
when hiring faculty members. Also, the top universities need to create a scalable curriculum that covers the entire English education of students. I believe that if the top universities can become role models in hiring faculty and creating effective curricula, other schools will follow. Finally, I would like companies to look more closely at what students have accomplished and the skills they have attained during their four years of college. If they do this, the universities will change. I'm pretty optimistic about our future. I feel that the institutions in academia and industry are slowly moving in this direction.

Hiraga: I think that both sides, English education and the corporate world, can work together. The key will be for corporations to first figure out what skills are needed for engineers to prosper in this fierce global competition. We need a success model to let the people listen. The breakthrough will be figuring out the needs. Once this is done, we can provide feedback to academia and start filling the chain of needs.

Yamazaki: I think it's all about a sense of mission. There are many people in various arenas, from academic to corporate, business to engineering, who have a strong desire to make these changes. The problem is that there aren't any platforms for these people to come together. As for the next step, I would like to see these people come together.

Hirai: First, we need to build a framework that the government, corporations and educators can use to come together to discuss English for scientists and engineers, including the creation of the "Can Do" statements for them. Then and only then can all stakeholders start thinking in the same direction. Currently, the corporate world is thinking differently and academia is doing the same. Once we create "Can Do" statements, then we can start thinking of people to hire and creating curricula.

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Profiles of panelists, moderator

● **Michihiro Hirai:** Hirai is currently a language-education consultant and freelance translator as well as a lecturer of technical English at Kanagawa University and Waseda University. After working 33 years as a computer engineer for Hitachi Ltd., he switched his career to language consultancy in 1998. In addition to a professional engineer certification, he has a B.E. from the University of Tokyo and an MSE from the University of Pennsylvania.

● **Masaharu Hiraga:** Born in 1939, Hiraga graduated from the engineering department of Tohoku University in 1963. He was formerly an adviser to Sanden Corporation. Through experiences in electrical and mechanical engineering at universities and product manufacturers, he spent considerable time teaching engineers technical-paper writing and presentation skills after having lived in the United States for three years. He was invited to teach English at the mechanical engineering department

of Gunma University for seven years (2001-07), during which time he taught using what he termed the "speaking-first method," a method to motivate students to use English language for specific purposes in the engineering field.

● **Laurence Anthony:** Anthony is a professor at the Faculty of Science and Engineering of Waseda University, where he teaches technical reading, writing and presentation skills. He serves as director of the Center for English Language Education in Science and Engineering (CELESE). He received a master's degree in TESL/TEFL, and a Ph.D. in applied linguistics from the University of Birmingham, England, and a B.S. in mathematical physics from the University of Manchester's Institute of Science and Technology (UMIST). His primary research interests are in corpus linguistics, educational technology, natural language processing (NLP) and genre analysis.

● **Atsuko Yamazaki:** Yamazaki is a

professor at the Shibaura Institute of Technology, where she teaches English communication in engineering. She holds a Master of Science in Computer Science and a Master of Arts in TESOL, and conducts research in communication as well as information engineering. She has held leadership positions in IEEE PCS and JACET. Her work has been published by Ecological Modelling, IEEE, KES and Japan Society for Artificial Intelligence among others.

● **Masafumi Otsuka:** Otsuka is the CEO of MANABI Ltd., a firm that offers private English lessons for professionals. Prior to starting MANABI, Otsuka used to work for Tokai Bank (now The Bank of Tokyo-Mitsubishi UFJ) as a corporate sales representative and then worked as an adviser to an educational startup company for two years. Otsuka is also a board member of the NPO Supporting Union for Practical Use of Educational Resources. B.A., Keio University; MBA, University of Virginia.