

Study Group on Development of Highly Skilled ICT Professionals—2nd Meeting
Summary of Minutes

1. Date and Time

Friday, October 19, 2007; 14:00-16:00

2. Location

Mimosa room, Toranomom Pastoral

3. Attendees (honorifics omitted)

(1) Study Group Members

Ishijima (vice chair), Oba, Kakehi, Saito, Shigeki, Dairiki, Nakajima, Harasawa, Onishi
(proxy: Iwakawa)

(2) Observers

Takahashi (Director, IT Office, Cabinet Office) (proxy: Kamiya), Fujiwara (Director, Technical Education Division, Higher Education Bureau, MEXT) (proxy: Sakaguchi), Yahiro (Director, Information Services Industry Division, Commerce and Information Policy Bureau, METI) (proxy: Nagami), Ueda (Manager, Information Group, Industry Section II, Japan Business Federation)

(3) MIC Representatives

Nakata (Director-General for Policy Planning), Matsui (Deputy Director-General), Suzuki (Director, General Policy Division), Matsukawa (Director, IT Utilization and Human Resources Development Division), Monma (Director, Innovation Strategy Division), Ohara (Deputy Director, IT Utilization and Human Resources Development Division)

4. Meeting Proceedings

(1) Opening

(2) Agenda

1) Activities undertaken by the Japan Business Federation for the development of highly skilled professionals (Japan Business Federation)

Ueda, from the Japan Business Federation explained Document 2-1.

2) Presentations by study group members

Oba and Dairiki, respectively, explained “Industry-Academic Collaboration for the Development of Highly Skilled IT Professionals (Document 2-2)” and “On the Development of Highly Skilled IT Professionals (Document 2-3)”, and questions were taken.

The contents of the discussion are summarized below:

- It is interesting to compare the training of medical doctors and ICT professionals. Companies are seeking ICT professionals who are, in a sense, good at performing surgery and caring for patients, just as in the medical field. In medicine, some are talented in medical practice, and some pursue the advancement of research. I wonder if these groups of people are educated differently from the beginning intentionally, or if they receive a balanced education in the first instance and then move off in different directions later.
- In case of the University of Tokyo, as an example, researchers conduct their research at the Institute of Medical Science, and many of them do not have a medical license. On the other hand, regarding the training of medical doctors, institutes like the International Research Center for Medical Education formulate and evaluate the contents of the educational programs by contacting individual universities. Thus, the education of researchers and medical doctors is split into two pathways.
- In the field of ICT, is there a clear understanding awareness that engineers need to be trained at universities?
- Universities have for many years produced researchers. If industry asks universities to supply quantities of project managers and architects, it will be difficult for them to do so. Industry and academia must collaborate to produce such workers.
- In the case of medical schools, most of the subjects are mandatory including both basic study and practical training. No thesis is required, and students do not have spend time looking for a job. Clinicians come to universities and lecture.
- In Japan, university engineering departments are very large and they have started to undertake scientific research. This has result in engineering being turned into a science, and a prevailing mood of disregarding education has been created among university professors. If we were to create ICT training institutions, personally I think it would be a good idea to create completely new schools rather than create new faculties within existing universities.
- HPI in Germany was also created as a new institute. However, to resolve the issue of awarding degrees, it is built next to University of Potsdam, and undergraduate and graduate programs are covered in five years.
- Degrees should be available. If degrees in engineering are not awarded, young people will not be attracted to it.
- The greatest difference between ICT workers resources and medical doctors seems to be the perception among the Japanese people that medical doctors drive a Benz and earn a lot of money. While some who go into medicine have the noble objective of serving the nation

through healthcare, some might be thinking that if they become a doctor, their future is secured.

- I agree with the idea that there can be no improvement in the world of pricing based on man-hours, but talking about unit cost alone will not help us solve the problem. If the unit price is reduced, in reality the man-hour cost increases. Because of that, the practice of RFP competitive bidding was introduced, but in many cases the vendor that won the contract went into the red. The issue of improving employment conditions goes very deep.
- Doctors and architects have national accreditation, but there is no national accreditation for IT. In fact, there is no qualification that can be recognized in salary and employment conditions. One idea might be to determine employment conditions based on a national qualification. In case of the building industry, architect firm and construction companies are separate, but this is not the case in the IT industry. Because the IT industry has a short history, the division of job functions might not have occurred to the same degree.
- Upgrading the minimum skills required for engineers to enter the workforce is a brilliant idea and this should be the direction we head in. If undergraduate and graduate education can cover a portion of on-the-job training, employees can develop their skills faster and become very effective workers for the company as well as for the nation. In pursuit of this goal, it is crucial that industry and academia engage in intense dialogue on the contents of advanced practical IT educational programs and curriculum and, further, create a mechanism which will allow such a system to penetrate into schools. This should further enhance the basic capabilities of new employees and lead to the creation of an even better system for producing top-class talent.
- When making comparisons with the field of medicine, we need to be aware of the issue of quantity. For instance, the enrollment limit at the University of Tokyo's medical school has been based a certain proportion of the population because the school is responsible for producing a certain number of elites. This probably hasn't changed since the establishment of the university. However, the engineering department is different. Before World War II, 3 to 5% of the population went to university under the previous education system. Now, 50% of the population graduates from a college, including junior colleges. We must be aware that the same old rules cannot be applied in this situation. In case of ICT, if we are going to produce a limited number of elites like medical schools, we must deliberate the number of elites to produce and if it is possible to educate 1,500 people at a time before we continue our discussions.
- In reality, all graduate schools that offer ICT training have been increasing the enrollment limit in the field of ICT due to the shortage of workers. However, only a small number of universities have ICT departments. For instance, the University of Tokyo's Engineering

Department does not have programs in information technology and IT engineering. Courses on information technology are included as part of the Engineering Department's courses in electrical engineering and machinery because knowledge of information communications is necessary for these subjects. But the universities are not producing IT experts. Because of this situation, we have a structure that allows people without basic knowledge of computer science, including knowledge of algorithms, to enroll in information-related graduate programs. We should think about these issues and then think about what we should do.

- There are no facilities near universities where actual software can be produced, which is problematic. We should address this.
- If companies offer good employment conditions for high-performing students, that should be enough of an incentive without the need for national accreditation.
- Employment conditions are determined by the track record within the company rather than external qualifications.
- I hear that medical doctors must present their research to medical congresses earn their qualifications. It takes three to five years to get qualified, but things are done in an orderly manner. Those qualified people are engaged in education. We need to do the same in ICT. How teachers are trained is important.
- Creating universities similar to those in India doesn't mean that we will be able to develop human resources in the same manner as those countries. In case of India, ICT engineers earn salaries on par with medical doctors and command respect. Because they are motivated, they take it upon themselves to improve their qualifications. Japanese students and workers are highly lacking in motivation. To break through this barrier, we are beginning to recognize professional specialization as another career path in addition to that which leads to becoming a section manager, director or executive. Specialized professionals are expected to contribute to society by teaching in universities, writing papers and creating networks within their industry and with universities. The fastest way to demonstrate the characteristics of such professionals in Japan is to create a framework for developing professionals and architects by advancing ITSS. The United States also has a circulatory system where people who have succeeded in industry return to universities or start venture businesses.
- I would like to universities welcoming teaching staff from companies.
- Aside from the economic aspect, the contents of ICT should be attractive enough to make the ICT industry appealing. It is also important to identify if ICT has anything equivalent to the concept of basic medicine in the medical field.
- Whether or not we can talk about visions for the future that can only be realized through

ICT technology is also important, in addition to long vacations and high salaries.

- An important part of realizing a vision to enjoy the process of actually creating something. Some say quality and quantity are lacking, but unless we improve the quality without decreasing quantity, the ICT workplace will become a dreamless 3K environment. If Japan competes in the same way as highly populated Asian countries, we will lose. They don't have investment funds and we can say that they earn foreign currency by utilizing people. Japan can invest in research and development and it is important to aggressively promote automation. The automobile and steel industries have grown by pursuing automation. Training 1,500 people in ICT means 45,000 people over 30 years, while the total number of workers in the industry is 600,000. This is a very small number. If a small number of select people satisfy the needs with the help of automation, their employment conditions should improve.
- It is also important to summarize the overall structure of education to show what education is to be provided at what level, that is, age.
- I would like to see industry complaining louder about Japanese students' inability to write proper sentences in Japanese. Writing skills should be acquired during high school or general education and universities should also give a thorough education, but this is not happening.

3) Study items (draft)

The secretariat explained Document 2-4 after took questions. After the questions, the document was approved. The contents of the discussion are summarized below

- Ongoing education for working people should be discussed in the scheme of graduate education. Speaking of a national institute, a good player is not always a good coach. Education of teaching staff should be included in the discussion about inviting lecturers from industry.
- How teachers are treated is very important.

(3) Meeting adjourned.