

Study Group on Development of Highly Skilled ICT Professionals—4th Meeting
Summary of Minutes

1. Date and Time

Monday, December 17, 2007; 14:00–16:00

2. Location

Conference Room 801, MIC

3. Attendees (honorifics omitted)

(1) Study Group Members

Muraoka (chair), Ishijima (vice chair) (proxy: Murakoshi), Onishi (proxy: Kanzaki), Oba, Kakehi, Kitagawa, Saito, Shigeki, Dairiki, Nakajima (proxy: Oshima), Harasawa,

(2) Observers

Takahashi (Director, IT Office, Cabinet Office) (proxy: Kamiya), Fujiwara (Director, Technical Education Division, Higher Education Bureau, MEXT) (proxy: Takahashi), 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) Harasawa and Kakehi, respectively, explained “Recommendation for the Development of Highly Skilled ICT Professionals (Document 4-1)” and “Enhancing Collaboration among Industry, Academia and Government in the Development of Highly Skilled Professionals: Ill Effects of Overlooking the Improvement of Standard of University Graduates (Document 4-2)” and questions were taken. The contents of the discussion are summarized below.

- Some universities have a department whose includes the word “information,” but some of those departments do not appear to have been designed for information and

communications or IT. Professor Takeichi of the University of Tokyo has quantitative data about this, and I would like someone to follow up on it.

- The members of the Council on Information Science Departments in Science and Engineering claim that they are providing education on information science within the field of science and engineering and that the number of such departments is now 150. If 60 to 80 students graduate from each of these departments, the total annual number of graduates would be around 9,000 to 12,000. The problem is the gap between this number and the number indicated in the Basic School Survey, which shows 22,000 graduates in this field. This seems to suggest that not all 22,000 graduates have really covered the basics of J-07.
- In the eyes of companies, the pool of workers with an information science background does not look large, about 10%. Some have become professional SEs even though their academic background is not in information science. Manufacturers welcome the beginning of the formulation of a standard curriculum for IT education as a sub-major or the basis of science and engineering studies, but I would like to know more about this.
- Assuming that about two years (64 credits) out of four of undergraduate education (124 units) are allocated to study of a major, we are thinking about formulating a rule for the common subjects for about one year's worth of the program during those two years. For example, we have organized subjects to be taught in a program for two-thirds of a 3 year (24 units), half a year (16 units), or a quarter of a year (8 units). We incorporated opinions from representatives of the business community, but I would like to hear from company and industry representatives in this kind of meeting regarding what should be included in each set of units.
- It is a good idea to send a few people who are identified as having potential to be future leaders back to school for a year or two after working for a company for at least five years. If companies secure core personnel early on, those people can drive the company business in the future as they accumulate experience.
- What kinds of contents of study programs would be appropriate for those who have five years' worth of actual work experience?
- It would not be to drastically improve communication skills and those people would not go back to school to acquire the knowledge required to work in banking. Our expectation is that they would review technical points in an organized manner, acquire the ability to come up with vendor-free scenarios and learn about all the products of major vendors.
- We send people with five or six years of job experience to study overseas and help them understand the essence of new technology and get them engage in debates. We cannot create an environment for this kind of exercise in Japan. These people who are sent

overseas acquire a lot of skills in one and a half to two years and are able to pass on those skills in the workplace. Students attending U.S. universities include those who had just finished undergraduate school and those who are very knowledgeable about actual jobs. This helps graduate students and teachers to develop. In Japan we don't have many places like this, which is a big problem.

- If we are to educate top-level people, we should create a place like Koan Ogata's Tekijuku, where self-driven people both teach and learn from each other. The University of Tokyo started teaching information theory as a required subject for freshmen, but it's not at all popular. The problem is that we don't have the right people to teach the subject. It would be better to create something analogous to a school the Japanese killifish, where participants act as both teacher and student and teach and learn from each other.

2) The Secretariat explained "The Development of Highly Skilled ICT Professionals in other Nations (Document 4-3)," and "The Need to Develop Highly Skilled ICT Professionals (Document 4-4)," and Ueda of the Secretariat Office of the Japan business Federation, explained "The Outline of the Recommendation: 'Proposal for the National Institute Concept—Toward the Acceleration of the Development of Highly Skilled Professionals in Information and Communications' (Document 4-5)" and a discussion was held. The contents of the discussion are summarized below.

- Personally, I think it's OK to have this study group identify the direction and resolve one or two issues. The ultimate end is another issue, but it will be difficult to move forward if our discussion starts with how we want to do things within the current school system.
- Out of technique, job knowledge and communication skills, job knowledge is supposed to expand as workers expand their understanding of computer systems and software and we cannot teach all job knowledge in advance. It seems necessary for them to acquire the ability to gain the required job knowledge, analyze and solve problems quickly when they encounter new issues.
- In that respect, it might be necessary then to provide an opportunity for them to gain academic knowledge beyond information processing.
- Although required job knowledge depending on the different circumstances, it is difficult to achieve a good understanding of a particular job without in-depth experience. Therefore, it's good to implement case studies.
- I think we need to talk a little more about the need to develop highly skilled ICT professionals. Our approaches should be different depending upon whether we want workers who can improve our international competitiveness in the ICT industry or if we

want them to enhance our national capacity. We need to take the view that we need ICT professionals regardless of the industry. ICT companies need to take the viewpoint of utilizing ICT workers properly and training younger workers. It is important to formulate a mechanism so that these efforts will become ongoing.

- It is necessary to get it straight in our mind that the development of highly skilled ICT professionals is not just for the benefit of the industries but for the nation. If we look at one section of the information service industry, all companies are competing domestically and the issue of the quality of students is not very relevant because all players have the same handicap.
- The ultimate goal is to create a system whereby a workforce is developed by the market mechanism, but something is also needed to ignite it. Right now students have nothing to sell so that companies hire new employees regardless of their university major. I would like to see companies fighting for graduates of Tsukuba and Kyushu. Some universities have potential to change, so we should not conduct our discussions based on the assumption that universities will not change. To ensure that programs are in place to train engineers, we should consider doing something drastic like providing different amounts of financial support to universities that meet social needs and do not meet social needs.
- There are many education-oriented projects but both the “Leading Program” and “Attractive Graduate Schools” have time a limit. Terminating those programs at the end of the time limit because of a lack of funding is irresponsible and unfair to students and we all suffer for it. Some research could be continued without funding by adjusting research methods, but it will take five to 10 years to truly assess the results of education. We should create a stable system based on a long-term vision. In this sense, the concept of a national institute is also important.
- Japanese universities were based on the model of German universities of the 19th century, which were designed to develop 19th-century researchers. If we are to train engineers, we need to create a place where engineers can learn from each other, where teachers and students can have debates about technology and where students admire their teachers. If we want to produce top-level engineers, we need to establish a university where a variety of people come together including those who wish to become sought-after engineers and university instructors who are very much interested in producing good engineers. We need a place where students of various ages and students from overseas can learn together. We can try to create a university where lectures, discussions, internships are done in English, and credits in English can be transferred and there can be exchange between faculties, a place where we let them work on many projects. If we try to do this, we can start to think about a system whereby people can teach and learn a variety of subjects. In this sense, it is

- necessary to create a completely new place for learning, such as a national institute.
- Listening to this discussion it seems that the corporate world asks a lot of the universities but I think that the companies also need to change. It's better for the companies to provide the workers and work together with them and then invite the universities to help them create a new structure.
 - Don't we need a new mechanism to develop a workforce for the country?
 - We'd better have had detailed discussions on what kind of characteristics we want workers to have for what purpose. An important point is whether to focus on helping people acquire in-depth technical knowledge on information processing or the ability to solve issues by applying ICT in the social realm.

(3) Meeting adjourned.