Study Group on Development of Highly Skilled ICT Professionals—5th Meeting
Summary of Minutes

1. Date and Time

Friday, January 25, 2008; 14:00–16:00

2. Location

Conference Room 1014, MIC Annex

3. Attendees (honorifics omitted)

(1) Study Group Members

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

(2) Observers

Takahashi (Director, IT Office, Cabinet Office), Fujiwara (Director, Technical Education Division, Higher Education Bureau, MEXT) (proxy: Sakaguchi), Yahiro (Director, Information Services Industry Division, Commerce and Information Policy Bureau, METI) (proxy: Okuie), 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) Based on Document 5-1, the Secretariat explained “The Status of Students Studying ‘Information’-Related Subjects in Undergraduate and Graduate Schools.”

2) Based on Document 5-2, the Secretariat explained the “Summary of Discussion Points.” The contents of the discussion are summarized as follows.

[Regarding “2. Current Status and Issues regarding Development of Highly Skilled ICT Professionals, (1) Current Status and Issues regarding Development of Highly Skilled ICT Professionals”]

- (1) 1) a) indicates “too busy with work,” but this is not the only industry that keeps people busy. The ICT industry does not involve manual labor, like the manufacturing and steel industries, and all employees need to generate profit through their jobs. The structure of the industry seems to leave little time for study.
- The structure wherein IT companies employ sub-contractors or sub-sub-contractors seems to be the problem. In my opinion, this is one of the reasons that human resources development is not implemented.
- As you pointed out, being at the lower end of hierarchy means that those workers are contracted only when work is available. This means small companies do no have money for education. This is a problem.
- Can we discover anything by pointing out the current status and issues regarding the industry? Although it might be necessary as part of the introductory remarks, I’m not sure how this argument relates to the theme of developing highly skilled ICT professionals.
- I think this discussion relates to “(1) Preparing Opportunities for Utilizing ICT Professionals” in “4. Specific Policies for Developing Highly Skilled ICT Professionals,” and the implication that companies also need to make significant efforts.
- In this study group we discussed the fact that simply improving incentives for higher educational institutions will not easily bring about the development of a workforce.
- If we list a lot of fine details, we might amplify the unattractive aspects.
- Industry has pointed out that there are issues at the level of secondary education, and MEXT has been taking actions to enhance the capacity to utilize information.
- In case of Finland, teaching has become an attractive occupation thanks to the national policy of placing a strong focus on education. We should take all possible measures to show teachers that they are valued. I would ask you all to think of ways we can demonstrate to people with the potential to become teachers that the profession is a respected one to encourage them pursue teaching as a career.
- Local governments have a strong influence on secondary education and below. We won’t be able to create the desired atmosphere without involving local governments.
- Secondary education, particularly competency in the Japanese language, is important, but rather than including all the important points, please include a statement to the effect that that the plan will start with the items in the list that can be implemented at that time.
- There may be difficulties in discussion on two aspects: ICT companies and clients of ICT companies. If we clarify the kind of workers required in Japan—whether they are in the field of major business systems, supporting design development or R&D—and then define the focus of the education, we should naturally arrive at the kind of education and mechanism to be included in the recommendation.

- According to the current categorization, the center of the focus will be IT workers in the field of major business systems. One of the issues will be whether to categorize people by company or job type, but it might be OK to restate clients of ICT companies as ICT departments.
- The area related to computers is costly. Do educational institutions have sufficient funds to finance these activities? Or are they working without a budget?
- Operating grants for national universities are decreasing and becoming competitive funds. This seems to be hurting the financial continuity. Teaching staffs are developing human resources while conducting researches, and this is imposing a burden on individual teaching staffs.
- Operating grants have been reduced and it has been very difficult to allocate funding for infrastructure. Competitive funding does not allow us to purchase equipment like computers beyond a specific purpose and it is inconvenient for institutes like us who undertake both research and education. The balance here is getting worse. What we should do about the fundamental infrastructure is a problem.
- Public universities have much less funding. We are trying to acquire external funding but in reality universities tend to put more weight on research and the budget for educational infrastructure is shrinking. When education and research are combined, the funding tends to be put into research, so it is good to concentrate on career-oriented educational programs only.
- Computers can be acquired by students themselves as well as by the research office, but the problem is that we have no large spaces for students to use do their group work.
- With the exception of some universities, people are working hard in a poor environment.
- Students going on to graduate programs are placed in certain research projects for purposes not related to their own training. These projects take up their time, which is a problem.
- The combination of job hunting and education should be considered. In reality, students cannot be trained beyond their junior year. In the senior year, they have to spend time on research activities because they belong to a research office. In addition, the second half of the junior year and the first half of the senior year overlap with the job-hunting period. This is the same for graduate schools. I wonder if we could work with industry to create a good situation.
- Concrete and other supportive data should be prepared as evidence of the mismatch between industry needs and the education provided by higher education institutions, and of the insufficiency of the basic knowledge of ICT.
- Ongoing education and refresher courses for workers are very important. Those students

who attend a school to polish skills they have stopped using are highly motivated to study.

- Regarding the current status and issues regarding the development of highly skilled ICT professionals, industries and educational institutions are organized, but the government has two aspects: it is a user of ICT and the executor of the measures for developing the workforce. I'm concerned that bureaucrats are not included in the scheme. Also, universities can be information users and another aspect to examine is whether sufficient support is provided to ICT engineers for education and research.

[Regarding "(2) Profile of Advanced ICT Human Resources Required in Japan," and "(3) Needs for Employing Special Approaches for Development of Advanced ICT Human Resources"]

- The characteristics of the workforce are constantly changing. We need to have a group of people, including representatives of industry, academia and government, to deliberate the kind of workforce required now, the kind of education need to develop such a workforce and who will be provided with such educational opportunities on what occasions. This links to the discussion on a national institute.
- Education requires investment over the long term. It's not something that we need for a limited time period only.
- Although it depends on how we view the fact that two-thirds of IT-related graduates are entering into non-IT fields, we need to recognize the fact that we are entering an era when all industries must include ICT as part of their foundation to stay competitive. The implication of this document should be that Japan needs to build a self-sustaining mechanism for producing the workforce it needs.
- It is wrong to think we will only have to act until the self-sustaining mechanism begins to function. It is important to think about a variety of actions to keep up with changes. Industry and academia have to collaborate from now on.
- We have to be considerate in the way we word the section on "Need to Employing Special Approaches in the Development of Highly Skilled ICT Professionals."
- If we take this to its logical conclusion, we will end up with the idea of closing down the universities that are not needed.
- Some argue that the Japan Business Federation should create its own university, but the counter argument is that the Federation pays taxes, and yet the engineering departments of national universities are funded by tax money but not producing engineers to meet the needs of the tax payers. To avoid sounding hypocritical when we tell the Federation and the financial community to provide education using their own funds, we need to get our

tax money back.

[Regarding, “3. The Basic Policy on Initiatives for Developing Highly Skilled ICT Professionals,” and “4. Specific Policies for Developing Highly Skilled ICT Professionals”]

- Research and education should be completely separated. If research and education are unified, students might be used researchers. Competencies required for engineering and research are different and educating both in the same place is not logical. Professionals should be trained in an environment dedicated to education.
- If the national institute is built as professional graduate school there will be some constraints upon it, in which case it might not be much different from the current situation. I’m concerned about whether it can be a place that can produce true ICT professionals.
- The recommendation by the Japan Business Federation is to keep the national institute separate from the graduate schools. The national institute would be a place where discussions on human resources development are a permanent feature. A professional graduate school should be attached to test the various ideas so discussed.
- There is also the problem of not having a place for teachers with industry experience to return after teaching for a certain time period. The national institute might be able to meet this need too.
- Carnegie Mellon University limited its acceptance to the students who had a secure job to return to after their studies. We shouldn’t have a professional graduate school unless the teachers have secure jobs they can return to after a certain period of teaching.
- In the Japan Business Federation initiative, teachers are dispatched from companies for two years, but sometimes there are requests to extend the contract. When companies dispatch top level engineers as teachers, they do not want those people to be gone for a long time. At the same time, universities are always worried about losing teachers. We are seeing if it is possible to limit the contract period for teachers from industry to one year, permitting extension when requested by the university.
- In reality if all the teaching staff work part time, the management of the organization becomes a problem. Is it OK if no university faculty members are involved in management? Another difficulty would be how to realize a place where a variety of people come together.
- The national government commissions prototype-like projects and student and teachers work on them. Research and education coexist there. The national institute then takes care of the details of management. I would like the national center to be like this. But it will be impossible to create a professional graduate school in existing universities.

- The Japan Business Federation considers that the national institute has a range of functions. By consolidating functions in one location, the place can serve as physical community for relevant people. An organization without space for practical activities will probably not be functional and we are recommending creating a professional graduate school which is continuously refining the processes by which advanced education is provided.
- I consider a national institute to function as a hub for these kinds of continuing discussions, sharing information about outcomes individual universities have achieved, in cooperation with industry and academia. A national institute is needed to bring about a transformation in our universities.
- There is a room for discussion about whether or not the national institute itself should be a professional graduate school. If it has a graduate school to manage, it might incorporate traditional university culture, which is a concern. What I expect from the national institute from the university point of view is not to have another competitor, but to have a new organization to support us.
- The Japan Business Federation and the business community may be inviting universities to engage in realistic collaborations for human resources development.
- The desire to establish a new national institute is stated to break with tradition. It is called a professional graduate school because graduate schools have the least constraints in the existing system.
- When creating a national institute, no matter what form it might take, it is critical that its nature and characteristics are communicated widely and widely understood, with no room for misunderstanding. If there is any misunderstanding, existing universities and graduate schools might resist which might prevent the institute from functioning properly.
- It should be attractive to students by appearing different from ordinary graduate schools.
- Regarding the place to develop ICT professionals, it is necessary to clarify the basic framework for the concept of place and budget. For instance, current discussions have been held without clarifying if there would be any prerequisite that must be satisfied to get support from the national institute, if the national institute would distribute funding, whether or not the national institute would have the authority to direct universities to a certain extent and if the national institute itself will have include a teaching campus. We need to add more details.
- While I agree with the need for a mechanism that can be sustained for a long time in the form of national institute, I don’t have a clear, specific image of the future after the institute is created. What universities are definitely missing are the facilities to produce software as part of the education program. The implementation of practical exercises has started slowly as companies accept interns. Regarding the mechanisms for projects, we

need to clarify what is missing and what is essential. Otherwise, we won't be able to come up with a clear image.

- In the United States and Europe, graduate students and faculties establish companies, and are motivated to work hard. In economically weak countries, universities do not have money and sometimes they develop systems to fulfill government functions for a low fee in order to survive. In both cases, faculties and students are improving their skills. Japan is just in the middle of these two, which is a very bad place to be. In Japan, is it possible for university faculties to take orders for systems development? For instance, is it possible for a private company to receive an order and then commission a university so that the university can train student through doing the work?
- There was a case in Hokkaido University where a company received an order and faculty members and students worked on it part time.
- However the difficulty is in the fact that we cannot impose responsibility on students in the same way as on regular employees.
- Isn't this a problem of not having a well-developed method of providing for practical education?
- Speaking of not having enough human resources in the IT field, can't we use non-Japanese people if they can work in Japan? The discussion will be completely different depending upon whether the subject is limited to Japanese workers.
- If it will benefit Japan, perhaps it's OK to include foreign engineers.
- The projects by the Japan Business Federation give me a strong sense of developing workers and we need to have a mechanism to continue offering such opportunities. Currently, it is based on voluntary actions of individual companies and universities, and it is impossible to sustain for a long time.
- The national center is a place to carry on the discussion among experts, and we cannot make a clear decision at this stage on what to be done in the center.
- As a report of this study group, I think it's better to formulate "4. Specific Policies for Developing Highly Skilled ICT Professionals, (2) Improving the Place for Developing ICT Professionals" by focusing on the image of a new place for professional development and the national institute.
- "3. The Basic Policy on the Initiatives for Developing Highly Skilled ICT Professionals, (3) Upgrading Competency of Potential Highly Skilled ICT Professionals" is written with a focus on soft-skills, and should be consistent with the awareness of problems as depicted in the "Place for Workforce Development."
- If this discussion continues after this study group has disbanded, the report should be written in a positive tone.

- While we are saying that existing universities are not good and need to do something new, we should clarify what aspects of existing universities are bad and why. There should be more discussion about whether or not the assumption should be to create a professional graduate school.
- The intent of the recommendation by the Japan Business Federation is not to create something completely different because existing universities are bad, but is to create a place for experimenting with something new because nobody is clear about anything, and to share the success with the existing universities.

(3) Meeting adjourned.