ヒトセミナー：セミナーによるバイオ情報の共有と発信

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　生命科学の知識を効果的に学ぶことができる教育用コンテンツのニーズが高まっている。我々は、日常的な研究教育活動を通じて、継続的に教育用コンテンツを生成する手法を提案し、ヒトに関する研究を行っている大学院生、若手研究者が、分野横断的に話題提供する、「ヒトセミナー」を実施している。ヒトに関する知識の全体像を共有し、ヒト学の創成を目指すものである。本発表では、2005 年度「ヒトセミナー」の成果と、一年間を通じて得られた知見について議論する。

Human Science Integration Seminar: Sharing and Transmission of Biological Knowledge through Successive Seminars

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Human Science Integration Seminar Project, which is organized by the Science Integration Program-Humans of the University of Tokyo, has been providing interactive seminars once or twice a month since April 2005, which are presented by the university members of diverse disciplines related to human science in order to embody research community and knowledge base towards human science integration, with the help of information and communication technology (ICT) especially web-based contents management systems (http://human.ws100h.net/). ICT enabled these interdisciplinary seminars involving diverse members of the University of Tokyo, and participants affiliated with diverse universities and research institutes.

1 Introduction

It is difficult to systematize the expanding scientific knowledge, mainly because there are invisible walls between different research fields. For one reason, human network of researchers are organized according to the affiliated departments and participating research societies. Therefore, it is difficult to get to know young researchers with each other academically, even if their topics or methods are similar. For another reason, knowledge structure and vocabularies of each domain are different, which make the relationship between each research domains unclear. These two reasons have synergetic effect. In order to make clear whole picture of human science for understanding human, it is important to facilitate interaction among human science researchers of different domains.

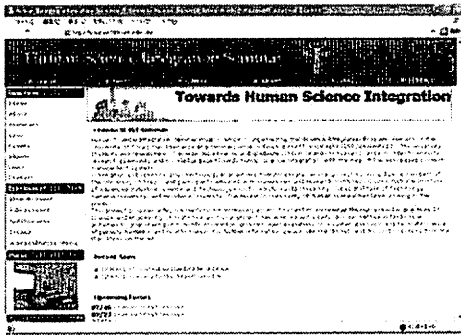The objective of this project is to embody research community and knowledge base towards hu-

図 1　Human Science Integration Seminar website[1]

man science integration, through encouraging interaction among students, researchers, faculties of different departments and graduate schools related to human science by the seminars. The organizer is trying to break the invisible wall between laboratories, departments, graduate schools, and research societies. The project proposes novel style of interdisciplinary research and education in the universities where integration of different disciplines are required in order to gain whole image of contemporary science. The method is put in practice in the University of Tokyo as a role model for the universities world wide.

2　People involving in the human science integration seminar project

2.1　Presenters

The seminars have been presented by the members of diverse graduate schools related to human science in the University of Tokyo. The project was started in April 2005 and has been held for 13 times and 16 people presented by December 2005. People from six graduate schools in the university including school of science, engineering, information science and technology, pharmacology, medicine, arts and science make presentations by December 2005. By the end of 2006, the project will cover people from every graduate schools related to human science.

2.2　Participants and Registrants

The participants and registrants of the seminars are students, researchers, faculties of the University of Tokyo, universities and research institutes including National Institute of Advanced Industrial Science and Technology (AIST), RIKEN, Kyoto University, Tokyo Institute of Technology (TITECH), Saitama University and Hiroshima University (as of December 2005).

2.3　Visitors

Assumed visitors of the Human Science Integration Seminar websites in English (Figure 1) [1] and in Japanese [2] are students, researchers, faculties involving human science and who would like to practice the similar interdisciplinary project for promoting communication among people of different disciplines in the world.

2.4　Organizer

The seminar is one of the core projects in the Science Integration Program - Humans, of the University of Tokyo. Mihoko Otake, one of the members of the Science Integration Program - Humans, came up with the idea of the Human Science Integration Seminar Project in April 2005. Since then, she has been organizing series of seminars and developing this community site. Co-organizers of the project are the members of the Science Integration Program - Humans, Toshihisa Takagi (Program Leader of the Science integration Program - Humans), Steven Kraines, Takaki Makino, Daisuke Hoshiyama, Haruo Mizutani (members of the Science Integration Program- Humans). The university official supported the administrative things like payment for the presenters of the seminar.

2.5　Science Integration Program - Human

The Science Integration Program was established in April 2005 under the direction of University of Tokyo President, Hiroshi Komiyama. The Science Integration Program - Human, started as the first activity in the overall program, will target integration of knowledge within the field of life science relating in particular to scientific knowledge of the human organism from genome to organism

level phenomena.

3 Protocol of the human science integration seminar project

Information and Communication Technology (ICT) enabled these interdisciplinary seminars involving diverse members of the University of Tokyo, and participants affiliated with diverse universities and research institutes.

1. Arrangements between the organizer and presenters have been done via e-mail because they are located in different campuses.
2. The organizer calls for participation to the seminars through e-mail to the registrants, and to the potential participants via the community site on the web.
3. The knowledge base on human science has been implemented utilizing XOOPS[3], one of the typical web-based contents management systems. The agenda and minutes of the seminars are registered on the web.
4. Participants are registered on the announcement list after the seminars if they are not registered. In this way, the research community on human science has been growing in the project.

3.1 Step 1: Find presenters

We take social networking method for finding the presenters. The speakers are either person who the organizer directly knows of or who the organizer is introduced to by their colleagues and friends, former presenters or participants. Requirements for the presenter are open mindedness, interests in networking and enough time for preparation. The organizer tries to find graduate students and young researchers because they form next generation of science.

3.2 Step 2: Arrange and prepare the contents of presentation

Once the presenter of the seminar is determined, the speaker decides the following items: title, keywords (less than 5), topics (around 3) and abstract.

The speakers are asked to include the common sense and background of their topics in their research fields. The organizer makes comments so that their presentations are comprehensible to the participants of different majors. Handouts and presentation materials are prepared based on the discussion and comments. Data sheet of the presenters is also filled out including their research fields, affiliated societies, advisors, titles of bachelors', masters', and doctors' thesis. Administrative works are done for payment if the presenter is a graduate student.

3.3 Step 3: Announce the seminar

Announcements of the seminars are done by e-mail to the registered people including date, time, speaker, title and keywords. The recipients are asked to forward them to their colleagues and friends. The same information is registered on the website (see 5.1).

3.4 Step 4: Hold the seminar

Presentation period with discussion for each speaker is about one hour to one and a half hours. During the presentation, photos are taken and the participants' lists are filled out. Handouts with references are distributed to the participants and presentation materials are submitted to the organizer from the speaker.

3.5 Step 5: Update the website

References, photos and links are registered on the website (see 5.1 - 5.3). Minutes of the seminars is added by editing the events and photos (see 5.4). Discussion among presenters and participants are summarized by presenters and participants. New participants are added on the announcement lists.

4 Sustainable development of knowledge base: Initial Setup

4.1 Step 1: Download and install CMS software and its modules

Among variety of Contents Management System (CMS), we selected XOOPS[3] for its usability and simplicity of administration. XOOPS is always updated. Therefore, we provide links to the website
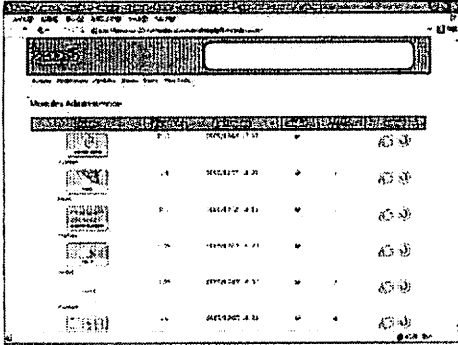
図2 Screen image of the module administration page

図3 Screen image of one of the Human Science Integration Seminar Abstracts

表1 Correspondence between the link names, modules, and weights

link name	modules	weight
About	TinyD	1
Seminars	TinyD	2
News	News	3
Events	event guide	4
Album	my album	5
Links	web links	6
Contact	liaise	7

so that the user can download the recent software. Contributed modules for XOOPS are also available. We selected the following modules: TinyD, Event Guide module, weblinks.

4.2 Step 2: Select and activate the modules

If the organizer logs in as a webmaster, the link to the administration menu is on the user menu of top page. Follow the links to administration menu → Modules → Administration. Then, activate the modules, rename them and set 'weight' for each. The links to the modules will appear in ascending order in the main menu. Screen image of the module administration page is shown in Figure 2. Correspondence between the modules, link names, and weights are listed on Table 1.

4.3 Step 3: Search and customize theme for your site

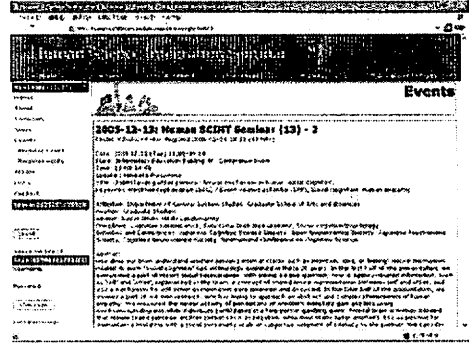You can customize the header image, fonts and background colors by editing theme files. Develop-

ers can download and extract the theme directory including several files.

Now, the initial setup for running the site for the seminar project is done. Let's move on to the 'Updating' steps.

5 Sustainable development of knowledge base: Updating

5.1 Step 1: Register events

Once the date, place and speaker are fixed, the organizer can register the seminar on the 'Event' module. Follow the links to administration menu → Event → Register Event. The organizer can edit and add the event information when the titles, keywords, abstract and references are available. We show one of the pages of registered event in Figure 3.

5.2 Step 2: Register links

Add links related to the presenters and participants to the 'Link' module. Follow the links to administration menu → Link → Register Link.

5.3 Step 3: Register photos

During the seminar, the organizer takes photos of the seminar. After that, these photos are registered on the 'Album' module. Follow the links to Main menu → Album → Register Photo. Figure 4 is one of the photos in the album.
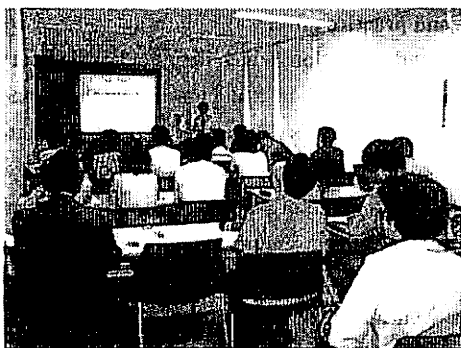
図 4 One of the photos of the Human Science Integration Seminar in the album
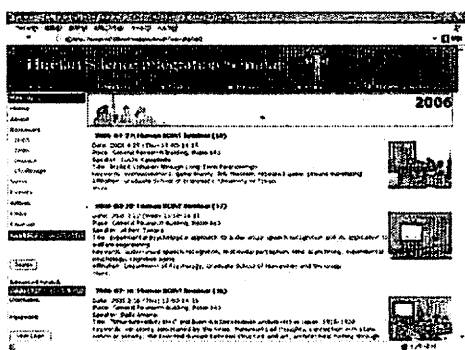

図 5 Record of the Human Science Integration Seminar in 2006

5.4 Step 4: Summarize the seminar on record page

Now that all materials are available on the web, the organizer sums up the seminar on the 'Record' page. It can simply be done by adding blocks on the 'Block' module. Follow the links to administration menu → Block → Add. We show the record in 2006 (Figure 5).

Every time the seminar is held, the organizer goes through Updating: Step 1 to Step 4. In this way, the knowledge of researches and researchers with various specialty and background are accumulated on the website. The organizer can build their own knowledge base and publish on the web. We can share the knowledge with people who missed or could not attend the seminars.

6 Practice and impact of the human science integration seminar project

We define an impact as the interdisciplinary members of the seminar project and interactivity. The impact is measured by the diversity of disciplines and amount of discussions who are involved in the project every time after each seminar is held. We count the accumulated numbers of participants, laboratories and departments. We also count numbers of questions and the characters of Q&A summary. We can see from the graph that diversity of registered members has been increasing through the series of seminars (Figure 6). After the thirteenth seminar in December 2005, 75 participants with 24 different laboratories, 14 departments are registered. Despite each seminar is kept small enough for discussion, participants are affiliated with different laboratories and departments. Varieties of laboratories and departments are wide compared to the numbers of participants. Discussions were active in the series of seminars. During 2005, maximum numbers of questions was 39 and average was 17 (Figure 7). Maximum numbers of characters in the summary was 7185 and average was 2822 in Japanese (Figure 8). Three characters in Japanese correspond to one word in English on the average. We would like to note that the summaries were written by presenters or the organizer based on their memories, and participants contribute their questions to them. The summaries are not necessary reflect the real amount and depth of discussions, but we can measure the amount of feedback to the presenters. For the purpose of increasing the impact, new presenters of various departments different from the previous speakers' affiliations have been invited. The organizer has been asking the registrants and participants to inform of the seminars to their colleagues and their friends.
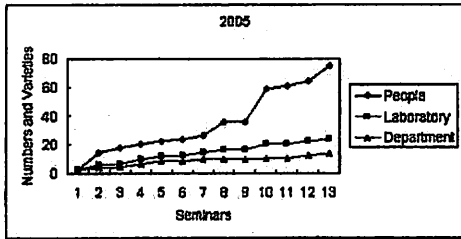
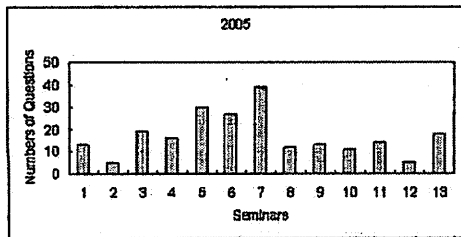図 6 Human Science Integration Seminar Participants in 2005

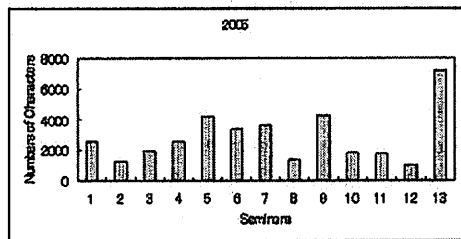図 7 Numbers of Questions at the Human Science Integration Seminar in 2005

図 8 Numbers of Characters in the Q&A summary at Human Science Integration Seminars in 2005

7 Discussion

7.1 Application

Seminars are ubiquitous for university research and education, which are often held within the laboratories or departments. Web-based contents management systems are widely used for developing community site, but are not used for networking researchers and developing knowledge base of interdisciplinary studies. Combining seminars and web-based contents management systems, we pro-pose and practice novel way of interdisciplinary research and education, which is to hold exploratory seminars presented by students, researchers, and faculties with diverse departments and graduate schools. Supported user processes are: Arrangements between the organizer and presenters; Announcement of the seminar to the registrants; Attracting registrants' attention to the series of seminars; Continuous development of knowledge base; Embodiment of interdisciplinary research community. How other people can use are as follows. On the implemented community site, the organizer of the project provide the protocol for organizing the seminars. Finding the speakers whose disciplines are far from the organizer is very important for making the seminars successful. Therefore, social networking method, which is asking for the speaker to find the next speaker, is effective.

7.2 Transferability

Where: The method is applicable to the universities which have diverse departments and graduate schools. Faculties or even students who are willing to form interdisciplinary research community can practice the method.

How: The rewards for the presenters are preferable but not necessary. Therefore, people who are interested in are able to start the project without budget. However, from the viewpoint of motivation and responsibility, $100 to $150 for each speaker is preferable, especially for graduate students. The organizer asks the presenters to prepare original handout and presentation materials for the seminar. The owner of the project has to prepare $1000 to $1500 per year if they hold ten seminars in a year. Development cost of community site is free because the system is based on open source software. Computer skill for the development of the community site is necessary for the organizer if they do by themselves. Additional cost for the development is needed, if the owners do not develop the community site by themselves.

8 Conclusion

The outcomes of the project are community, collaboration, and knowledgebase.

Community: Through the project, infrastructure for integrative research emerged, which is the human network of human scientists of diverse disciplines including, but not limited to: science, engineering, information science and technology, pharmacology, medicine, education, arts and science.

Collaboration: The collaboration among participants has been realized. The proposal based workshop based on the community site technology has already been delivered by the owner for different research community whose goal is to combine information technology of different specialties, parallel computing and recognition methods[4]. The websites are also on the web ([5] in Japanese, [6] in English). Workshop would accelerate the collaboration among participants of this project.

Knowledge base: The accumulated summaries of each seminar form introductory knowledge base of human science. The archives of the seminars are useful for freshmen who would like to overview the human science research, and decide their majors. Hopefully, this online knowledge base leads to formal textbook which cover the various aspects of human science. Recently, importance of access to scientific knowledge has been recognized [7, 8, 9]. The project provides innovative methods and models for providing open availability on a sustainable basis and facilitating reuse of publicly-funded scientific information. This is one of the goals of the Global Information Commons for Science, which was proposed in the World Summit on the Information Society in 2005[10].

Milestones are the coverage of presenters' and participants' disciplines. The project focuses on but not limits to neural, brain, cognitive, behavioral, leaning sciences and social intelligence studies.

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[9] CODATA: *Committee on Data for Science and Technology*, http://www.codata.org/.

[10] WSIS: *World Summit on the Information Society*, http://www.itu.int/wsis/.