

Recent Moves in Promoting e-Learning in Japanese Higher Education With a focus upon OER

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Abstract

Moves towards the wider adoption of information and communication technology (ICT) in Japanese higher education began with the government initiatives in late 1990s due to the urgent need for universities to respond to societal and global changes such as cultivating high-level human resources required in the new workforce, dealing with continuing drop of college age population, matching world's best practice in providing more opportunities for flexible and life-long learning, and promoting international deployment of Japanese universities. This presentation provides an overview of the recent moves to reform Japanese higher education institutions by the use of ICT in teaching and learning. It also discusses educational policies and some issues in promoting e-Learning in Japanese universities focusing on new development and initiatives in building Japan Open Course Ware Consortium (JOCW) based on a case study in OER conducted by the authors.

Keywords: e-Learning, educational reform, international deployment, OCW, OER

1. Introduction – Educational Reform in Japan

In the Japanese higher education system there are currently 708 campus-based traditional 4-year universities (of which 87 are National Universities, 76 Public Universities, and 544 private Universities), 508 2-year Junior colleges, and 63 technical colleges. In addition to these formal universities and colleges there are 2,964 Professional training colleges in Japan. At these higher education institutions 2,505,950 students and 224,026 graduate students are studying. Due to the drop of birth rate and decrease of the college age population since the mid 1990s, the number of enrollments in higher education institutions has continuously lowered. While it was at its peak with 2.05 million in 1992, the 18-year-old population decreased to 1.15 million in 2003, which led most of universities to turn to the adult population and life-long learning, and to implement serious initiatives for the use of ICT in teaching and learning to cater to the needs of this new 'market and clients'. This, along with other drastic societal changes in response to globalization, prompted the Government of Japan to adopt policies to promote various strategies for educational reform through e-Learning.

Traditionally there was not much necessity for distance education since Japan is geographically a small island nation where publicly-funded higher education institutions are placed in prefectures and municipalities across the whole country. Furthermore, the

recurrent education did not prevail as corporate on-the-job training programs have been well established in the private sector. However, because of changes taking place at every phase of society along with the current of time outside of Japan, the government has initiated e-Japan Strategy since 2001, and promoting e-Learning has become one of the important issues in higher education in Japan. The use of ICT is being promoted in a number of higher educational institutions, but the current status of e-Learning in Japanese higher education is not at the same level as that in its Western counterparts.

Under these circumstances OER is not so widely recognized in Japanese higher education, and few universities deal with OER. In the past year, however, there have been two initiatives that promote OER in Japan. One is NIME-GLAD developed at NIME, which is a higher education information and reference portal to distribute learning resources. The other is JOCW, Japan Open Course Ware Consortium, which provides a wide range of free and open academic course materials used in university classrooms through the Internet.

2. OER Moves in Japanese Higher Education

NIME-GLAD – A Comprehensive Information and Reference Repository

NIME is planning to prioritize its R&D into e-Learning, on which universities and other institutions of higher education currently place great emphasis. This project has been pursued mainly by the R&D Department of the Digital Learning Resources Division in collaboration with the Program promotion Department, and will incorporate a network to support collaboration with universities and other institutions currently developing e-Learning courses. NIME aims to support e-Learning courses at universities and other institutions by centralizing all Japanese higher education e-Learning services, thereby enhancing teaching and learning in classrooms and providing convenience to students.

In this network, metadata known as LOM (Learning Object Metadata) is similar to the library index card. Tagging LOM to all Internet e-Learning courses enables learners to use a LOM Search System to check related information across all universities. It is hoped that this scheme will contribute to an increase in the number of university students enrolled in e-Learning courses. NIME is also considering R&D into using mobile phones to automatically receive information from universities via the Internet.

The system and the information provided by NIME-GLAD are as follows:

(System)

- New LOM (Learning Object Metadata) search function
- Student registration and certification system
- Learning management (setting learning goals / managing academic records) function
- e-mail notices function
- Conversion service to cell phone
- Online payments function
- Management of academic results and course accreditation
- Self-check of professional ability
- System of links to National Information Center for Education Research(NICER)
- Other

(Information Provided)

- e-Learning courses at universities, etc
- Learning content at universities, etc
- Academic lectures at universities, etc
- Public seminars at universities, etc (lifelong learning)
- Information on university syllabi
- NIME online educational materials
- Information on copyright for educators
- Information on learning support
- Information on searching for elementary to lifelong education

Japan Open Course Ware Consortium (JOCW)

In 2001 MIT launched an unprecedented educational venture, the first OCW project by providing free and open educational resources such as syllabi, lecture notes, etc. for faculty, students, and self-learners all over the world. MIT has successfully been operating this innovative project and providing an increasing number of its courses openly. The MIT OCW has currently published 1250 of its 1800 university courses. These educational materials are now used worldwide and are well recognized as useful open educational resources.

In May, 2002 the researchers of National Institute of Multimedia Education (NIME) and Tokyo Institute of Technology (TIT) went to study the MIT OCW, which led to an OCW pilot plan with 50 courses at TIT in September. In 2004 MIT approached 7 national universities and 2 private universities and urged them to launch OCW projects in Japan. Later in the same year these universities built an alliance and shared ideas on how to deal with OCW in the respective universities.

In May, 2005 the Japan Open Course Ware Alliance (JOCW) was founded in cooperation with MIT by six leading Japanese universities. It was composed of four national universities; Kyoto University, Osaka University, Tokyo Institute of Technology and the University of Tokyo, and two reputable private universities; Keio University and Waseda University. These six universities started to offer the content of their academic courses, including syllabi and lecture notes to the general public through their own OCW web sites.

Subsequently, on April 20, 2006, a year later since the JOCW Alliance started to provide course wares, the OCW International Conference was held at Kyoto University where the common issues regarding OCW were discussed by participating institutions from the US, Europe, and Asia. At this conference JOCW was reorganized as the Japan Open Course Ware Consortium with new three national universities gaining memberships; Hokkaido University, Kyushu University and Nagoya University. The JOCW member universities have been working to enhance and promote the academic content of their own OCW web sites and ongoing projects. The JOCW as a nation-wide consortium is also addressing several major problems in common, including copyright and intellectual property issues. Since some of these problems are influenced by regional legal concerns, the JOCW Consortium is challenged to jointly find the most appropriate solutions.

JOCW is a unique organization in that it has been managed by a nation-wide collaboration of the top ranking national and private universities. In the respective member universities

the OCW started by a top-down decision, not by individual researchers. In order to gain a membership it has to be authorized by an internal committee and need to be officially administered. Therefore, sustainability can be expected and the quality of the content is assured to a certain degree. It has been operated for more than a year, and the access in Japan and from abroad has been evaluated with positive outcomes.

3. A Case Study on JOCW

The authors of this paper conducted a case study on the newly established JOCW as part of their ongoing research project "AIDE" at NIME in collaboration with the study launched by OECD/CERI in Open Educational Resources Production and Use. The JOCW member universities are involved in open content production and users of OER. Along with the current trends in Japanese higher education where the government has set a high priority on the policy to promote e-Learning and the use of ICT, it made it timely to find more about the newly established JOCW Consortium as a viable institution in the study of OER.

This case study was conducted by site-visits to the original six member universities of the JOCW Consortium. The six interviews took place from May through June this year. The following are the findings of the case study.

1) Characteristics of the Member Institutions

The General Secretariat of the JOCW Consortium is located at Keio University on its Mita campus in Tokyo. The scope of OCW activities varies from one university to another. The brief descriptions and characteristics of member universities of the JOCW Consortium are as follows:

The University of Tokyo

The University of Tokyo is one of the leading national universities in Japan with the number of full time faculty 4,191, administrative staff 3,342, undergraduate students 14,893, graduate students 13,884 in 2005.

The UT OCW is a web site to make UT course materials that are used in the teaching of almost all undergraduate and graduate subjects available on the web, free of charge, to any user anywhere in the world. UT OCW offers 10 courses per year, which are pure products of the Tokyo University. The UT OCW is offered in principle in Japanese and in English. As of July 2006, a total of 21 courses are available on the UT OCW from the following Schools: The School of Mathematical Sciences, The School of Medicine, The School of Engineering, The School of Humanities and Sociology, The School of Science, The School of Arts and Sciences, The School of Education, The Graduate School of Frontier Sciences, and The Interfaculty Initiative in Information Studies.

The UT OCW is characterized by two operational tools, one is Podcasts and the other is MIMA Search System. One of the courses, Global Focus on Knowledge 2005 / Science of Matter provides the streaming video of the lectures which can be viewed by Podcasts. The MIMA Search System is the Tool of Structuring Knowledge. This will enable the users to get a panoramic view of its educational resources. MIMA Search will not only allow the users a

panoramic and quick view of the courses at the University of Tokyo but also of numerous courses offered at other universities that have joined the OCW.

The UT OCW is a key educational support of the University of Tokyo's plan of Structuring Knowledge. It is operated by the UT OCW Secretariat which was formed out of the e-learning working group located at the Educational Planning Office of the University of Tokyo.

Keio University

Keio University is one of the reputable private universities in Japan with the number of full time faculty 2,357, administrative staff 2,753, on campus undergraduate students 27,971, off campus 10,667, graduate students 4,312 in 2005.

Keio University acts as one of the host institutions of the WWW Consortium, and has long been engaged in pioneering research and development in the field of information technology. In 2008, Keio University will celebrate its 150th anniversary as the first modern, comprehensive educational institution in Japan. Keio OCW has been launched as part of a program to offer to the world the knowledge generated by Keio University.

The KEIO OCW is open-ended educational content from the courses taught at Keio University, including syllabi and lecture notes, made available on the Internet to support higher education. The purpose of offering these materials is to make it available free of charge to anyone with Internet access, and to transform the knowledge accumulated at Keio University into a form that can be used by the whole of society. In addition, by disseminating to the world material that supports the advanced education traditionally pursued by Keio University, the University also hopes to promote research exchange between educational institutions throughout the world, and to contribute to the development of new, advanced educational programs that will be required in education in the future.

Keio University started its OCW with the lectures offered by faculties in relation to social sciences which are the foundations of the University. The course wares provided include the courses required in major fields of Japanese and Asian studies such as Economic History of Japan, Formational History of the Modern Japanese, etc. The KEIO OCW site has an English version and a Japanese version, and 12 courses from the three faculties of Letters, Economics, and Law are made available

Kyoto University

Kyoto University is one of the leading national universities in Japan with the number of full time faculty 2,911, administrative staff 2,269, undergraduate students 13,257, graduate students 9,198 in 2005.

Kyoto University OCW (OCW@KU) is a project to make the educational materials used in Kyoto University's lectures available publicly on the internet. The goal of the OCW@KU Project in a long-run is to transmit educational information from Kyoto University to the rest of the world. Through this project, it enables the University to gather intellectual assets common to all people from around the world, and create an environment in which anyone

can access and use this information. The ultimate goal is to contribute to the improvement of educational environments not only in Japan but throughout the world.

The project aims to share Kyoto University's lecture content with a wide range of people, including its own students, faculty and staff, students and researchers at other universities, high school students applying to Kyoto University and adults seeking continuing education. The immediate objectives of OCW@Ku are as follows:

- part of the University's contribution to society
- enhancement of the University's visibility
- show-window of the University's lectures
- provision of the detailed version of syllabi to students
- provision of the course materials to students
- recruiting better students and instructors
- feedback effect to the instructors by making their teaching materials open

The OCW@KU project started as a test project from October, 2004 through March 2007. It aims to clarify the number of staff, facilities, budget needed for its operation and also social impact, PR effect, etc. by experimentally promoting OCW. On the end of this test operation it is to be assessed and decided whether to continue or not.

It started offering at least 10 courses on the web in May, 2005 with a goal of providing 50 courses over a period of three years as listed in the following: Faculty of Integrated Human Studies(5), Faculty of Medicine(1), Faculty of Pharmaceutical Science(1), Faculty of Engineering(6), Faculty of Agriculture(5), General Education(15), Graduate School of Economics(2), Graduate School of Science(1), Graduate School of Science(1), Graduate School of Medicine(5), Graduate School of Engineering(2), Graduate School of Human and Environmental Studies(1), Graduate School of Informatics(1). Of these courses, 45 have currently been offered, and the initial goal has been attained. From this year it has started distributing image and vocal files through Podcasts.

Osaka University

Osaka University is one of the leading national universities in Japan with the number of full time faculty 2,485, administrative staff 2,027, undergraduate students 12,125, graduate students 7,825 in 2005.

Osaka University OCW provides educational materials actually used in the courses taught at the University. It aims to fulfill the responsibilities as part of the University's mission to take part in knowledge building networks and to provide a means for exchange of knowledge by making available the University's intellectual assets based on its teaching and research activities.

In February, 2002 the participation of Osaka University was decided by the internal committee meeting. Subsequently Cybermedia Centre was designated to operate the OCW with the budget allocated to the Centre. Cybermedia Centre deals with contents management on the server, uploading teaching materials, sorting out the materials, and copyright clearance. It has developed a software to manage the web-based OCW contents

by itself to carry out and maintain the OCW managing operations.

In 2005 thirteen courses were made available, and this year the following fifteen courses are provided: Engineering(9), Engineering Science(1), Human Science(1), Information Science and Technology(4). Of these the number of the copyright clearance cases exceeds 160.

Waseda University

Waseda University is one of the reputable private universities in Japan with the number of full time faculty 1,664, administrative staff 886, undergraduate students 45,732, graduate students 8,043 in 2005.

Waseda University has been promoting to build up an innovative university managing system to lead the kind of education and research required in the new millennium such as e-Learning focusing on "On-demand lecture". On-demand lecture is defined as an "officially accredited course offered by a university and made available via the Internet". Lecture content of the course consists of lecture video and digital study materials transmitted to students via the Learning Management System (LMS). Students are able to access lectures anytime and anywhere, including PC rooms at universities and at home, as long as Internet is accessible.

Waseda University has now developed Waseda University's OCW in order to assist in building a basis for the worldwide educational network by OCW. Waseda OCW is linked to its electronic lecture information search system where information on the syllabi for the current courses is available. Course materials have been published by the Waseda faculty members who agree with the concept of OCW through the system.

In 2005 twelve courses were made available on the OCW; that is, 1 course from School of Letters, 8 from School of Science and Engineering, 2 from Open Education Center, and 1 from Graduate Programs.

Tokyo Institute of Technology

Tokyo Institute of Technology (TIT) is the leading national science and technology university in Japan with the number of full time faculty 1,141, administrative staff 547, undergraduate students 5,007, graduate students 5,054 in 2005.

Tokyo Institute of Technology OCW(TOKYO TECH OCW) is a platform that provides free of charge the outlines of the lectures offered at TIT to make the TIT's science and technology teaching as part of the common assets of the world.

TIT, the first Japanese university approached by MIT trying to promote OCW in Japan, has been involved in OCW from its earliest stage by dispatching an investigative research team to Boston and implementing a pilot project. Of all the member universities of the JOCW TIT provides the most number of course materials. As of July, 2006 it makes available 145 courses in the fields of Science, Technology, Engineering, which composes 40% of the courses offered at the University. Of these 24 courses are provided also in English.

One characteristic of the TIT's OCW web site is that it can display the course list according to the order of access-ranking and uploading. It shows that basic general subjects and newly uploaded courses tend to have a high access rate.

2) Content Production

In Japanese universities there are few experts in content production, which makes it difficult to get support on campus. There is a center for information technology at each university in Japan but with few staff, 20% of these centers have 4 staff and the majority has not more than 8 staff. Their expertise is in computer science but only few are experts in educational technology. Therefore, in many cases instructors themselves are basically engaged in content production with a few technical staff supporting to provide open contents. The main support entails IPR/Copyright clearance, English translation of the materials and registration on the server.

At UT OCW the Center for Research and Development of Higher Education is involved in Media Production which consists of 1 leader, 1 professional staff and 5 students. In Media Production the students play a major role because they actually take courses and are familiar with the contents. The student responsible for production makes an appointment with the instructor and receives the materials. Each of the materials provided for OCW goes through a copyright clearance process. The students involved in content production are trained for copyright clearance. The principal policy of UT OCW is not to have its own facility needed for content production due to scarce funding and difficulty in sophisticated designing with high quality. So part of the production that requires images and high technical skills are done by outsourcing.

In the whole of the member universities they have non-open e-learning sites mainly for on-campus students. The University of Tokyo has two educational media, UT OCW and TODAI TV. At the University of Tokyo it has become an issue to provide a wide range of educational opportunity in response to growing diversity of students, such as an increasing number of students not taking physics and biology courses, more students coming into graduate programs from the real world and from abroad. TODAI TV is a web site to distribute lectures and public addresses offered at the Tokyo University, aiming to provide a learning opportunity for these students. Also, the fundamental lectures and courses offered at the respective faculties and schools are made available by web streaming, some of which are made open to the public.

The content production is done in a more institutionalized form rather than as a grass-root activity. As an example, at the University of Tokyo its OCW project has been promoted through the whole management system. Under President and Vice-President there is the Office for Planning (internal committee). The OCW project is operated with research support by the Centre for Research and Development of Higher Education and administrative support by Academic Affairs Office. There is a project team to promote ICT for education placed in the Office for Planning. Researchers from various Schools and Research Institutes participate in this project team. The decision on matters regarding UT OCW is made by the Vice-President and this project team.

Many of the JOCW activities are promoted as a two to three year project with internal budget at the respective member universities. An issue that the JOCW needs to address in common is to work out systems to provide sustainable OCW, for which more collaboration with the private sector or NPO, and building a good business model seem to be required. However, as one of the interviewees mentioned, there seems to be a certain degree of variance within the JOCW between national and private universities in terms of linkage to be built with the private sector.

The JOCW originally was launched for the purpose of promoting OCW in the whole higher education environments in concerted cooperation among leading universities. It functioned as a loose educational community to benefit each other from the know-how and intellectual assets accumulated, ensuring the originality and autonomy of each participating university.

The Copyright Law in Japan provides no provision to deal with asynchronous education. In other words, it requires an approval on all images and video clips over which the instructors have no copyrights. For instance, at Osaka University they deal with clearing copyrights on the course material provided for OCW of which the instructor is not the original author. In the initial year they dealt with 160 cases of which the approved cases were 111 or 70%. The breakdown of these approved cases shows 75 cases (about 70%) for OCW publication, revision by the third party and redistribution, 28 cases for publication and redistribution, and 6 cases for only OCW publication. In processing the copyright clearance, it is pointed out such problems that it takes too much time to specify the author, or that it is much too difficult to get approval from publishing companies. The JOCW needs to address these problems.

There is no reward system in place for those instructors providing their teaching materials for OCW. About the merit of instructors to provide course materials for OCW the following were mentioned by the interviewee as typical answers:

- It provides a support for digitalizing the teaching materials
- It saves the time to prepare for the teaching materials for students in classroom.
- It provides an opportunity for getting feedback on the materials
- It helps to have the copyright cleared by making them available on the Internet
- It increases a possibility for publication
- It is an ideal project since it is difficult to implement Open Educational Resources by individual researchers.
- It provides an opportunity to restructure and systemize the lectures by participating in the OCW project.
- It offers a personal satisfaction just to know that the people of foreign countries where they would never have a chance to go will use the materials of their lectures through the OCW.

There is an involvement from the management level in the individual university. To give an example in the JOCW, the gist of the goals provided on its top page reads “the OCW@KU Project is to transmit educational information from Kyoto University to the rest of the world. Through this project, the University will gather intellectual assets common to all people from around the world, and create an environment in which anyone can use this information. The ultimate goal is to contribute to the improvement of educational environments not only in Japan but throughout the world”.

3) Open Course Use

As it has been only a year since the JOCW was launched, no tool for evaluating the access and analyzing the data has been developed. At most of the JOCW member universities evaluation and analysis of the access by various users and the contents that have been accessed are currently under way for future implications, especially at Kyoto University where they are to make assessments on the OCW test project since the fiscal year 2007 falls on its final year.

Except for a few member universities the JOCW makes only highly selective courses available for OCW. At Waseda University they provide “on-demand lecture” as part of the internal service for the whole University. In 2006 against 1,556 courses offered on-campus and 218 courses through e-school, only 12 courses have been provided for OCW at Waseda University. The reason for the small proportion is that they try to explore a way in which to provide only high quality courses that cannot be found at other universities.

The access number in the whole JOCW varies to a certain degree from one university to another, however, on an average there has been 8,000 to 12,000 per month at each member university. Initially there were more access numbers to the JOCW site, but later the direct access to the site of each member university has increased. The number of users has been continuing to increase. The number in the month of February is remarkably increasing, probably by applicants seeking admission to the university. Also, the number of access from abroad (from Asia with China in particular) which used to be very few, has been increasing, probably by those wishing to study in Japan.

At UT OCW the access number over the past year has been 6 million, an average of 500,000 per month, most of which are through Podcasts. The number fluctuates as it increases when a new course is provided and then gradually tapers off after that. The least is 3,000 downloading per day.

4) Open Source Software

Through the site-visits it has been found that in the JOCW no Open Source Software (OSS) has been produced nor used yet. The production and use of OSS is yet to be considered in the JOCW. Some of the member universities have been developing their own software but without making it open. Most of the member universities are more concerned about expanding and supporting their on-campus based e-Learning programs. At Kyoto University, however, they are examining the possibility of using “Edu Common” developed and made available by Utah State University for its OCW operation.

4. Summary

Each of the JOCW member universities is required to provide teaching materials such as syllabi, lecture notes, streaming lectures from a minimum of 10 courses. The decision to start the OCW projects was made by a top-down approach either to President or Vice President, however, the driving force for the actual operation and maintenance of the OCW has been a single faculty member designated by the top management. Though the project

started as an authorized and integral part of the university management, their work is not necessarily recognized even on their own campus. Open content production has been outsourced in many cases. The OCW projects have been run by budgeting as part of internal project with few staff assigned just to work for the OCW. The average access number is 8,000 to 12,000 per month.

The JOCW Alliance was a loose organization before the International OCW Conference was held at Kyoto in April this year. Now that the JOCW has since been rebuilt as a consortium, it is expected to more closely collaborate among the member universities to tackle the issues they have in common. The issues yet to be addressed are like building *Sustainability and Integration*, establishing an appropriate *Business Model*, building a linkage between on-campus *LMS and CMS*, enhancing the *Rights* of teaching staff, maintaining *Quality Assurance*, developing *Guidelines* in common, clearing *IPR/Copyrights* and clarifying for educational use, consolidating overall *Feedback* systems, enhancing *Motivation* of the staff with incentives and rewards, and promoting more *Usability and Interaction* among member universities.

In the years ahead the JOCW is expected to promote activities further in enhancing Public Relations for proper understanding of the universities, enhancing the quality and opportunity of higher education, acquiring more funds with capable students, teaching staff and researchers, and transmitting Japanese intellectual assets to the world.

During the site-visits certain interviewees expressed their views on the future direction of JOCW that it would proceed towards tri-lateral networking between North America, EU and Asia, building trans-national consortium and collaboration, building an international OCW consortium, contributing to enhancement of education in the developing part of the world, and eventually contributing to globalization of higher education.

5. Conclusions

OER which was started by MIT is not just the provision of course wares, nor developing soft wares or LMS associated with it. With the advent of information communication technologies that brought a 'paradigm shift' in higher education where education is no longer the property of one single culture or a nation state but it goes beyond political and cultural boundaries, OER has potentials towards globalizing education if that is the direction the world is going into. Therefore, it can be studied from all sorts of angles with various aspects and viewpoints by different disciplines.

As mentioned earlier, the time is right and the tide is rising for OCW to flourish in Japan with the general trends of higher education to further the technology supported teaching and learning along with the government's e-strategy initiatives which lead to getting universities more involved in e-Learning and catching up with the currents outside of Japan. Since the Kyoto conference OER is gaining more recognition among university managements and individual researchers, and an increasing number of universities are becoming interested in joining the JOCW Consortium that was rebuilt by the original six universities with three more universities newly participating. The JOCW membership is expected to expand in the years ahead.

Only a few months since its rebuilding as a consortium, it is still premature to speculate how and whether the JOCW could deal with the issues and fulfill the goals mentioned in the above. In order to become an integral institution that contributes to OER, the JOCW Consortium needs to forge solidarity among the member universities and build a rationale for OER on its own, different from that of MIT, which would support the international deployment of Japanese universities and also Japanese style e-Learning.

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Useful links

- JOCW <http://www.jocw.jp/sub2.htm>
- The University of Tokyo <http://www.u-tokyo.ac.jp/>
- UT OCW <http://ocw.u-tokyo.ac.jp/>
- TODAI TV <http://todaitv.ep.u-tokyo.ac.jp/>
- MIMA Search <http://ocw.u-tokyo.ac.jp/english/mima-search/>
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- Tokyo Institute of Technology <http://www.titech.ac.jp/home.html>
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