

CENTER FOR ENVIRONMENTAL INNOVATION DESIGN FOR SUSTAINABILITY, OSAKA UNIVERSITY

Newsletter

July. 2013

No. **3**

CEIDS's "Project to Form Environmental Innovation Design Education and Research Center to Achieve a Creative Technological Society" has entered its second year. This newsletter will continue to introduce its readers to CEIDS's wide-ranging initiatives. In this issue, we introduce the Co-creative Design Laboratory for Sustainability that CEIDS opened in Umekita and report on an educational symposium CEIDS held in April. We are also starting two new series with this issue. "CEIDS Research" will take up one distinctive CEIDS research theme in each issue. "Researcher Interview" will feature talks with researchers engaged in CEIDS activities.

1. Co-creative Design Laboratory for Sustainability Opens at Grand Front Osaka KNOWLEDGE CAPITAL

Osaka University's CEIDS has opened Co-creative Design Laboratory for Sustainability at KNOWLEDGE CAPITAL (in Grand Front Osaka). The purpose of the design laboratory is to advance interdisciplinary research and education for a sustainable society. By promoting university–society collaboration, it will also take sustainability science beyond the campus and out into the community. This article features research and education programs to be conducted at the laboratory, and describes its location and environment.

The lab is collaborating with Prof. Atsuko Kaga (Osaka University Graduate School of Engineering, Department of Business Engineering) on the topic of urban and regional development. Together they are analyzing city information needed for urban planning and development and pursuing planning techniques that take advantage of ICT technology and biomimicry.

The location in Umekita enables university–industry–government collaboration and ensures that research is practical.

The laboratory plans to offer two seminars for working adults. One is the CEIDS Sustaina-Seminar.



Co-creative Design Laboratory for Sustainability is located in the second tower from the left (Tower C) here at Grand Front Osaka

1. Co-creative Design Laboratory for Sustainability Opens at Grand Front Osaka KNOWLEDGE CAPITAL (2)

This course readies working people and citizens to establish a sustainable society, taking a workshop approach to the actions essential to imagine and form such a society. The other is the “Training Program for Local Revitalization Coordinators for Creating Regional Innovation.” Lab research partner Prof. Kaga also helps run this program. The course will develop personnel who can coordinate local revitalization by looking at local issues from all angles and turning this perspective into measures for addressing them. By invitation, specialists and professionals will introduce participants to the latest case studies and research. Participants will gain a deeper understanding of the issues by conversing and working together with these experts.

Co-creative Design Laboratory for Sustainability is located on the 9th floor of KNOWLEDGE CAPITAL, Tower C. The laboratory offers space that can be flexibly used. In addition to the above seminars, it is set up to host research-related meetings, small workshops and lectures, and more. Besides CEIDS, many types of organizations are located at KNOWLEDGE CAPITAL, including university, research institute, government, and private enterprise offices. From this location, CEIDS aims to expand its research and educational initiatives.

[Co-creative Design Laboratory for Sustainability]
3-1 Ofukacho, Kita-ku, Osaka City, Osaka Prefecture
9th floor, Grand Front Osaka KNOWLEDGE CAPITAL

[Organizations located at KNOWLEDGE CAPITAL]
VisLab OSAKA (of which the Osaka University Cybermedia Center is a collaborating partner), the City of Osaka, Kansai University, Osaka City University, Osaka Institute of Technology, Keio University, National Institute of Information and Communications Technology (NICT), Urban Innovation Institute, Toshi Miryoku Kenkyushitsu (Osaka Gas Research Institute for Culture, Energy and Life), Asia Pacific Institute of Research, and many private enterprises

*Please contact the CEIDS office at the Suita Campus if you would like to visit the lab (see the end of the newsletter for contact information)

*Please note that seminar course names are subject to change.

(Hiroyuki Takeda, Assistant Professor, CEIDS)



KNOWLEDGE PLAZA



Inside Co-creative Design Laboratory for Sustainability



View from the lab

2. Educational Symposium “Nurturing People for a ‘Creative Technological Society’ : Invitation to Environmental Innovation Design Studies”

CEIDS held this educational symposium at the Osaka University Suita Campus Convention Center on Wednesday, April 10, 2013. The symposium focused on imagining the professionals’ that support a society of a Creative Technological Society and how to train them. (a Creative Technological Society is one that can envision the future and work together to build the science technology, products, and systems suitable to it.) One representative each from university, industry, and government gave a talk. (See Table 1.) The lecturers got into some lively discussions with the 109 participants, who included 62 students (57% of all participants), 34 university teaching staff (31%), and 13 others (from enterprises, non-profits, private citizens, etc.; 12%). The high ratio of students reflected the particular focus of the symposium.

The symposium consisted mainly of three sessions as outlined in Table 1. To start things off, Prof. Itaru Yasui (Vice President Emeritus of United Nations University and Trustee of National Institute of Technology and Evaluation) gave the keynote speech on the topic of “Environmental Innovation in Advanced Education.” He made the point that a Creative Technological Society can only be formed by inducing social transformation (i.e., innovation), and that developing the professionals capable of bringing about this innovation requires innovation of the “advanced education environment” itself. In the first lecture period, participants learned about the philosophy and current state of research and education at CEIDS. Additionally, student Ryusuke Tanimoto described a CEIDS practical course he had taken, entitled “Theory of Sustainability Evaluation and Technology,” and fellow student Saori Wadagaki introduced activities of the

Table 1: Symposium schedule

13:00	Opening remarks (Tomoyuki Kakeshita, Director, CEIDS)
13:10 - 14:00	Keynote speech: Environmental Innovation in Advanced Education (Prof. Itaru Yasui, Vice President Emeritus of United Nations University and Trustee of National Institute of Technology and Evaluation)
14:00 - 14:45	Lecture period 1: Philosophy of CEIDS Activities, and Students at CEIDS ----- The Founding Principles and the Students of CEIDS (Keishiro Hara, Associate Professor, CEIDS) Report on Environmental Innovation Design Training Results (Ryusuke Tanimoto, second-year student, Division of Global Architecture, Osaka University)
	Introduction to the Activities of Osaka University Environmental Circle GECS (Saori Wadagaki, third-year student, Department of Sustainable Energy and Environmental Engineering, School of Engineering)
15:00 - 16:30	Lecture period 2: Training of professionals for a Creative Technological Society ----- Investigative Report on the Overseas Education Program as well as The Current State of and Suggestions Regarding the Curriculum for Environmental Innovation Design Studies (Yusuke Kishita, Assistant Professor, CEIDS; Michinori Uwasu, Associate Professor, CEIDS)
	Solving Environmental Problems Requires Professionals : Based on My Experience in Administrative Positions [Kenji Shiraishi, Business Manager of the Global Environment Centre Foundation (on loan from Ministry of the Environment)] Professionals Sought for Global Corporations (Hideyuki Ohnishi, Japan representative for GE Power & Water)
16:30	Closing remarks (Shinsuke Yamanaka, Deputy Director, CEIDS)

Osaka University environmental circle, called GECS (<http://gecs.main.jp/>). Their presentations were very easy to understand. Then the second lecture period discussed



Prof. Itaru Yasui's keynote speech



Speech by Mr. Kenji Shiraishi



Speech by Mr. Hideyuki Ohnishi



Lively discussion ensued between lecturers and participants

2. Educational Symposium “Nurturing People for a ‘Creative Technological Society’ : Invitation to Environmental Innovation Design Studies”

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results of a CEIDS survey, conducted in FY2012, of university educational programs outside Japan. There was also a report on the curriculum of CEIDS’s graduate-level advanced subprogram, Environmental Innovation Design Studies. Following that, Mr. Kenji Shiraishi (Business Manager of the Global Environment Centre Foundation) gave a talk called “Solving Environmental Problems requires Personnel” He used his abundant experience with international cooperation to take on that question, which he addressed primarily from a policy planning perspective. Mr. Hideyuki Ohnishi, Japan representative for GE Power & Water, spoke on “Personnel sought by Global Corporations.” He explained General Electric’s philosophy and practice of human resources development and the type of personnel they require.

Each lecturer, speaking from his or her own unique perspective, had hints for the audience on developing the human resources necessary to achieving a Society of original concept techniques. After the symposium, several participants indicated they wanted to take the practical course Mr. Tanimoto had described. Students also indicated the lectures had increased their research and study motivation. Students who were job-hunting

noted that Mr. Ohnishi’s talk had given them much to consider as they thought out their path going forward.

These comments and the lecturers’ messages backed CEIDS’s direction for developing the professionals to support the Creative Technological Society. On the other hand, “something” is missing from current Environmental Innovation Design for Sustainability curricula seeking to develop the professionals described in the speeches of Prof. Yasui, Mr. Shiraishi, and Mr. Ohnishi. Starting this fiscal year, CEIDS plans to add new practical courses to further enrich the Environmental Innovation Design for Sustainability advanced subprogram (<http://www.ceids.osaka-u.ac.jp/education/02.html> [English version is “<http://www.ceids.osaka-u.ac.jp/english/education/02.html>”]). It will be essential, through these courses, to gradually identify that missing “something.” Though the job is only halfway done, CEIDS will put every effort into both education and research. We hope we can count on your continued support.

(Yusuke Kishita, Assistant Professor, CEIDS)

3. CEIDS Research 1: Seventh-Generation Vision Research

Markets are usually described as a mechanism for efficiently allocating resources. Humanity’s skilled use of this market mechanism has helped many nations achieve economic growth. Democracy, on the other hand, is a mechanism for society to make decisions by majority rule. In a representative democracy, societies hold elections to pick their political representatives. While this mechanism cannot guarantee social and economic development, it can prevent a dictator, for example, from controlling a nation for a long period.

These mechanisms at the core of our society are eroding. Although markets can allocate resources efficiently to people alive today, this allocation does not

account for the resources that future generations will use. The present generation is using too much of the resources that future generations would otherwise use,



An experiment in discussing issues

3. CEIDS Research 1: Seventh-Generation Vision Research

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and this is clearly a cause of global warming and the loss of biodiversity. The market mechanism accelerates these phenomena, so that mechanism is not a solution in itself. Other problems are involved, too, including the current problem of fairness: societies and individuals that do not use the mechanism well do not enjoy the advantages of growth. But democracy has also been seriously eroded. For one thing, the problems facing modern societies are so complex that decision-making by majority rule cannot guarantee the right answer. Even the experts cannot always agree on how to solve economic and environmental problems. Another issue is the trend in industrialized nations whereby people are having fewer children and the population is aging. This is said to be significantly skewing the results of elections to decide our political representatives. In an aging society, policies favoring senior citizens take priority, while investment in the future (younger generation) is neglected. The failure of many industrialized nations to put the brakes on their budget deficits may be related to both of these.

In recognition of this problem, CEIDS has begun the “Seventh-Generation Vision Research Project,” bringing together researchers from a broad range of disciplines, including economics, design engineering, environmental engineering, urban planning, sociology, and forestry. We propose to put these experts together as a group (the “seven generations into the future group”) to represent the future in today’s society and involve this group in decision-making processes. In terms of governmental organization, such a group could perhaps be called a “Ministry of the Future.” Or if it were a think tank, it might be called a “Future Research Institute.” Whatever we call it, we need to test exactly what kind of group would be able to generate the information (a vision as seen by the present generation) to represent the future (i.e., make decisions on its behalf) and what kind of mechanism it would take for such a group to become involved in present-day decision-making processes.

The objective of this research project is to devise a negotiating framework to ensure the fair allocation of resources. Realistically, most of the problems faced

by modern civilization, such as those related to global warming and energy systems, are massive and complex. Society’s decision-making processes are characterized by insufficient scientific understanding, uncertainty, and value judgment. Experiments in the fields of political science and communication are seeking to build visions by getting all types of stakeholders to participate in and discuss issues. However, this participatory discussion approach does not have well-established vision-creating techniques or methodologies, so its effectiveness has not been adequately verified. Moreover, such initiatives are negotiations between present-generation stakeholders, so neither future generations nor conscientious present-day groups are necessarily participating in a clear way. The research project seeks to help establish a methodology for the participatory discussion approach by testing three things: 1) What kind of group can represent future generations? 2) What kind of methods are there for negotiating issues such that future generations also participate? 3) How will the participation of future generations alter the decision-making of the present generation?

[Project members]

Kochi University of Technology (Osaka University CEIDS, Visiting Professor): Tatsuyoshi Saijo;

Osaka Prefecture University College of Economics: Tatsuhiro Shichijo;

Hitotsubashi University Institute of Economic Research: Reiko Aoki;

Kobe University Research Institute for Economics & Business Administration: Shen Junyi;

Osaka University Graduate School of Economics: Masahiko Ozaki;

Osaka University Graduate School of Engineering: Masashi Kuroda;

Osaka University CEIDS: Michinori Uwasu, Keishiro Hara, Yusuke Kishita, Hiroyuki Takeda, Yukari Fuchigami

(Michinori Uwasu, Associate Professor, CEIDS)

4. Researcher Interview No. 1, “Collaboration is Like Writing a Table of Contents for a Textbook”

Prof. **Yasuo Takahashi** (Professor, Joining and Welding Research Institute, Osaka University)

Visited: June 11, 2013

Visited by: Keishiro Hara, Yukari Fuchigami

Hara: Tell us about your specialty, meaning your research themes up to now, and research themes going forward.

Lately, I mainly study material science, but my research also includes joining and welding science, system science, and environmental science. Material science is a very practical form of engineering, but to really spread it widely requires systems thinking. And my research has further branched into environmental science as I have started to take environmental problems into account. Every researcher probably feels the same, but as I get older, I find it necessary to get more involved with management and see the big picture in my research endeavors. I find there is really no choice but to reach into all sorts of fields and broaden my research.

My main research theme at this time is joining solids. I am very interested in the bonding of solids, in joining and pressure-bonding them without adhesives. Such technologies are being used in electronics and power devices, for example. At the heart of every automobile is a power control element. I partner with enterprises to develop this type of device.

Hara: When did you first get involved in automotive research with business enterprises?

Nearly 20 years ago. When I make things with people who work in the business world, I am reminded how a single problem has within it all types of issues and problems of different levels. In the business world, you are considered successful if one idea out of 100 leads to an actual product. But in the process of actually turning an idea into a product, you have to solve all sorts of problems that appear along the way. It is not just a matter of nano-level or macro-level technology. And when you handle items that are not made of a single

piece but a compound of pieces, you get compound problems. Theory and idealism do not always help in the process of commercializing a product, and one type of material is not enough to make a single automotive part. Looked at this way, you could say there is a kind of “issues fractal.”

Hara: Going forward, what kind of issues do you see at the meso level to ensure that technical development is used to solve society’s problems?

One aspect of meso-level research is the making and industrialization of things. In research that actually uses individual technologies for the benefit of society, the efforts of the individual researcher are important, but at the same time it is also important to consider how the national government allocates funds for research. I often hear people say that the way the Japanese government allocates its backing, that is to say, its budget, scatters its funds too much as compared to countries such as South Korea and America. Certainly, the national government’s investment system could use some improvements. In basic research, or research that specializes in a single phenomenon, individual researchers may achieve a degree of success depending on their skills. But problems that involve complex systems, such as the relationship between technology and society, are ultimately economic and industrialization problems. It is extremely important to design a social vision and from there allocate research funds strategically. In that sense, the government that is responsible for deciding major policy directions has an important role to play.

Hara: Tell us what it looks like when researchers on the vision side collaborate with researchers on the technical seeds side.

Just bringing together people with different expertise does not cause anything to start automatically. You do not get people together first and then try to do something; that is the wrong order to proceed. First, you need to clarify your objective and then get everyone

4. Researcher Interview No. 1, “Collaboration is Like Writing a Table of Contents for a Textbook” (2)

pointed toward that same objective. Researchers in the fields of conceptual design and marketing, for example, may not completely grasp the struggles and actual conditions of technical development. However, when everyone has clear, common objectives, it is possible for researchers from different fields to work together. The leader should have a comprehensive, bird’s-eye view of the project, and then, in some sense, propose working together under a system in which each member has responsibility. When that happens, cooperation is the result. But such cooperative work is very difficult, so it is important that leaders and followers trade places from time to time and that everyone is flexible as they work. Of course, it is not necessary that every single member have the talent to serve as the leader of a large organization. However, if members can form groups that support the leader in the spirit of team play, collaborative research will go that much more smoothly.

Hara: So it is important to divide up roles within teams.

The leader begins by clearly outlining specific research content based on the vision, that is to say, the objective. Outlining the content is an important part of advancing meso-level research or any cooperative project or business. A vision by itself is not enough to get anyone moving. But if the content is clear, then it will soon become clear what it is that people have to do. It might be easier to understand if you imagine writing a table of contents for a textbook or any other book. A textbook has a detailed table of contents that specifically explains the themes and content of the book. We frame our research to create such a table of contents. Then following that table of contents, you clearly describe the role of each researcher. That is the leader’s job. Doing this will promote cooperation.

Vaguely defined projects without a table of contents will not go smoothly. Of course, even projects with clear objectives can end in failure, but if there is a definite table of contents, then you can use it the next time you have a chance.

Also, it is a good idea to set your vision and goals

a little high. If your objectives are too easy to meet, your team will meet them and progress will stop there. You ought to broaden your objectives and set high hurdles to a point where you think the team probably cannot reach them. This gives each member a clear awareness of his or her own role. Members will cooperate if they feel “this project will not succeed without me.” It’s my belief that a leader needs two skills: the ability to talk the big talk when they set goals, and the ability to build connections and networks between people so that they can achieve those goals. If they can do that, then even if the project is a failure, it will still leave a trail to follow the next time.

Hara: Can we get your comment on meso-level research?

When you’re young, you can find research funds as long as there is someone who supports your research. However, as your research develops and grows larger, for example, if it grows to the meso level, so-called capital becomes essential. Ultimately it is important to have a vision that brings in capital (research resources) and also to have some demonstrated results from your research. Demonstrated results are necessary to get research funds. To produce results (i.e., write research papers), you have to read a lot of papers by other people.

What I would like to tell young people is, “You cannot write papers unless you read them. Read a lot of papers, understand the excellent research that has been performed in the past, and then generate new ideas and new value that will take your own research to a higher level.”

**(Keishiro Hara, Associate Professor, CEIDS;
Yukari Fuchigami, Project Researcher, CEIDS)**

5. Introduction of a New Member

A young faculty member joining CEIDS in FY2013 introduces himself.

Hikari Shimadera, Assistant Professor

My name is Hikari Shimadera, and I took the post of assistant professor at CEIDS in April 2013. I earned my PhD in engineering from Osaka University's Division of Sustainable Energy and Environmental Engineering, Graduate School of Engineering in March 2011. Subsequently, I worked at the Environmental Science Research Laboratory of the Central Research Institute of Electric Power Industry (CRIEPI) for two years before joining CEIDS.

My main research theme is dynamic analysis of environmental substances through numerical simulation models. I have done analyses on various subjects, with a focus on air pollutants on scales ranging from individual cities to the entire Asian continent. At CRIEPI, I did research mainly on fine particulate matter (PM_{2.5}), which has become a widely recognized problem since January 2013. There has been a lot of research on Asia-wide air pollution since the 1990s, and I also knew that there has not been much change in PM_{2.5} levels in Japan, so the sudden increase in the public's interest in PM_{2.5} was greater than I had imagined it would be. It reminded me that there is a big difference in awareness of things between specialists and non-specialists, and even between specialists from different disciplines. So I have come to believe in the importance of interdisciplinary exchange for mutual understanding.

My specialty, numerical simulation, is an essential technology for quantitatively evaluating the impact of human activity on the environment. It also has an important role to play for studying and evaluating measures for social sustainability. CEIDS already has faculty with a wide range of expertise. I hope that my joining the staff further adds to the scholarly diversity of the organization and helps advance its interdisciplinary research. I will also do my best to expand the scope of my own academic pursuits and help advance environmental innovation design

education and research. I hope you will give me your advice and encouragement.

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