

Global NSEE Workshop 2008 -Nanoscale Science and Engineering Education at Arlington, VA

International Concept on Nano-science and Nano-engineering Education and Research Training

International Perspectives on Formal & Informal NSEE Programs
November 12, 2008

Tadashi Itoh

*Graduate School of Engineering Science, Osaka University,
Organization for the Promotion of Research
on Nanoscience and Nanotechnology, Osaka University*

*Supported by Ministry of Education, Culture, Sports, Science and Technology,
Special Coordination Funds for Promoting Science and Technology,
through “Fostering Talent in Emergent Research Field” program*

Motivation

Many scientists all over the world now realize the importance of education and research training in the fields of nano-science and nano-engineering, since they are really multi-disciplinary covering physics, chemistry, biology, materials science and engineering etc. and become important key technology for the sustainable development.

In order to hand on the accumulated knowledge of the related fields to graduate school students and younger scientists who will design and develop new kinds of fields for future nano-science and nano-engineering, what kinds of education and training should we prepare and practice?

Purpose of this Panel Discussion

Our panel is aimed for the discussion how we can develop international graduate-level education and training program and network for the promotion of research on nano-science and nano-engineering. It may be quite useful for us to join together for the discussion of our experience on the education and research training in order to develop future international collaboration all over the world.

The following four subjects will be discussed.

1) Nano-science and nano-engineering are day by day changeable. How do we organize the graduate school education and training in these fields?

- ◆ To establish a new school or department specialized in some fixed fields as a major.

most effective for already developed fields, but few chances to catch up the changes.

- ◆ To make collaboration among many related schools and prepare new flexible programs in these fields as a minor.

not so effective for present specialized fields, but many chances to catch up the changes.

2) Nano-science is multi-disciplinary. How do we accelerate and maintain the interaction between many fields?

- ◆ To make joint classes for many students specialized in different fields.

How to overcome the gap caused by different backgrounds and unfamiliar technical terms?

- ◆ To establish joint laboratories or a research center for training.

How to give attractive subjects rather easily accessed by students from different fields?

3) Nano-science and Nano-engineering are interchangeable and directly connected to many kinds of unexpected industrial use. In education and training, how do we keep contact with various application fields?

- ◆ Lectures by specialists coming from industries and think tanks

easy to organize, effective for knowledge, but not so practical to develop wisdom

- ◆ Cooperative research training with industries to educate flexible ability in many application fields

difficult to organize, but quite practical especially for PhD student career-up

4) Nano-science and Nano-engineering are internationally developing. How do we organize effective international academic exchange among graduate school students and young scientists all over the world?

- ◆ To increase the number of exchange students and young scientists among institutions with academic program

How to accelerate students' motivation?

- grant, credit transfer, sandwich program, etc.

- ◆ To prepare different subjects suitable for interests of students from different countries

How to match with their interests?

- advanced research, practical application, etc.

*The actual graduate-level career-up and
refresher programs now going on in Osaka
University are presented
in Poster Session II.*

Home Page:

**[http://www.sigma.es.osaka-u.ac.jp
/pub/nanokiko/html/english/index.html](http://www.sigma.es.osaka-u.ac.jp/pub/nanokiko/html/english/index.html)**