”ASPECTS FOR THE DEVELOPMENT OF ENVIRON-MENTAL EDUCATION - EE - IN THE LIGHT OF TRANSDIS-CIPLINARY PRACTICE”

Environment and School Initiatives – ENSI, Visionary workshop

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INHALTSVERZEICHNIS

INTRODUCTION

The Swiss National Science Foundation and the Swiss Federal Institute of Technology were accomplishing a Transdisciplinary Conference end of February 2000 in Zurich. The Conference was providing a forum for an extensive reflection of the ´state of the art´ of transdisciplinary practice and research. Participants from all disciplines and nearly all continents were discussing in dialogue sessions and working in mutual learning sessions. The value of transdisciplinarity lies not only in its potential to provide better solutions, but also in its ability to **identify problems** at an early stage.
http://www.snf.ch/transdisciplinarity/home.html

TRANSDISCIPLINARITY

Complex problems challenge our societies – in the North as well in the South. the quality of life of present and future generations largely depends on our ability to produce knowledge and apply it to our common needs. Of course science has to play its role. But what kind of science do we need? Real world problems often cut across existing disciplines. Transdisciplinarity offers the prospect of generating the relevant knowledge. Transdisciplinarity implies cooperative research driven by social needs. Through mutual learning, it can lead to better and quicker solutions at lower costs.

The ETH-UNS case study form a compulsory part of the curriculum in environmental sciences at the ETH Zurich. Students are confronted with a complex, socially pertinent real world problem, in which environmental issues are of crucial importance. Within a transdisciplinarity context, different disciplines, systems, interests and types of knowledge are integrated. Within the case study some methods are more suited for interdisciplinary work, others are especially suited to support transdisciplinary processes. (OSWALD / STAUFFACHER / SCHOLZ: 2000):

CASE STUDY METHODS

Four levels of INTEGRA-TION	Analysis	Area Development	Future Workshop	Life Cycle Assessment
Interests		XX	X	
Knowledge	X	X	X	
Systems	X	X		XX
Disciplines ($\sum \pi \Omega$)	XX			X

Case studies can help to understand complex problems by organizing mutual learning processes between science and society. The case is an abstract problem. On one side of the river there are the students and their tutors. The question for the students is, how to cross the river.

On the other side are case experts like politicians, authorities, children, farmers and others.
- Your first assumption is, you can use an existent solid **stone bridge**. Now you get in contact with the experts from the other side and they are telling you about the case.
- The second approach to solve the problem is, you build a **new bridge** with your students and you are developing new methods.
- But if you arrange with your students a **river rafting**, than you feel the problem and all students have to work within the case.

SUSTAINABLE DEVELOPMENT

The word sustainability has become some kind of a "mantra" for the 1990s. The sustainability movement offers a holistic response to the environmental crisis that makes connections between nature, culture, values, power relationships and technology. The World Commission on Environment and Development presented the highly influential report "Our Common Future" in 1987. According to the report "Sustainable development" is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. (VAN DER RYN: 1996)

On reading "Our Common Future" more carefully, we find that sustainability is to be attained by more rapid economic growth, freer market access, lower interest rates, and greater technology transfer. On the one hand, sustainability is the province of global policy makers and environmental experts, flying at thirty thousand feet from conference to conference. On the other hand, sustainability is also the domain of people committed to changing their own communities or indigenous people preserving traditional practices. In contrast ecological sustainability requires limits to technology, limits to the stress (factors) placed on the biosphere and reducing material flows and it also needs the change of our value system.

It means to change attitudes and values. Today we count architects who build skyscrapers to have a valid knowledge, whilst we do not see that equally sophisticated information is needed to grow food without pesticides is signified in an ecologically sustainable way.

ENVIRONMENTAL EDUCATION - EE - A LIFELONG LEARNING PROCESS

The list of environmental problems is endless. Our central European metropolitan regions with a linear metabolism takes what it needs from the vast area, with no taught for the consequences, and throws away the remains. Input is mostly unrelated to output. For instance Vienna's city sprawl outwards along urban motorways, has the tendency to be deserted. To make cities ecologically viable again, their functioning needs to be rethought and reorganized. Their metabolism should become circular which means every output can also be used as an input into the production system. (GIRARDET: 1992)

We must ask ourselves, what kind of learning we use to get ecological awareness. I think, we must learn from our cases. If we want to prepare our students for a sustainable world, we also have to overcome our present school structures. For instance, industry has the problems, but our school system and the universities have only departments. This means we have to ask ourselves, what are the real problems.

Scharmer believes that most of the problems in our time are problems caused by our thinking. (SCHARMER: 1996) This leads us to the central question of <u>what learning really is?</u> One possible way to influence the ways of thinking is a change in the culture of teaching and learning in our educational system. It is not only gaining knowledge, much more important is obtaining a better quality to use this knowledge. (NONAKA/TAKEUCHI: 1995) The <u>creation of knowledge</u> certainly involves interaction between two kinds of learning:

- <u>The first kind of learning</u> is obtaining "**<u>know how</u>**" in order to solve specific problems based upon existing premises. This kind of learning has helped us to survive.
- <u>The second kind of learning</u> is establishing **new premises** (paradigms, schemata, mental models, or perspectives) to override the existing ones. Of course its a necessity to know about both kinds of knowledge.

This includes the process of constant communication, learning together with others, developing key qualities, like systemic approach and project management, to create optimistic visions of the future in a constant team dialog.

Richard ERNST was talking at the conference about the future of science and transdisciplinarity and this also can be seen representative for EE. He was introducing himself as an "old saucier" who wanted to give one central message to the auditorium. What we need is personal **responsibility,**

- in research
- responsibility of public teaching and
- responsibility of contributing towards the conception of a lasting global order.

We as teachers are in a very privileged situation. We have to be responsible and this needs lifelong learning and also working in the real world, organize public teaching, give lectures, go to the medias and let people understand what we are doing.

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