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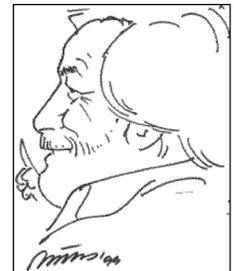


## Transdisciplinarity in Higher Education, Part 3: BOKU and the European Union

Sue MacGregor and Russ Volckmann



Transdisciplinarity in higher education can show up in many ways, as research efforts (e.g., [Arizona State University](#)), degree programs, even as innovations in higher education in the form of small liberal arts colleges, such as the [College of the Atlantic](#) on a small island off the coast of Maine in the U.S. In looking around at such initiatives, most often we find integrative efforts that bring faculty and students together with communities and businesses to address a particular challenge. These can include, for example, issues in sustainable fu-



tures, technology and education. Sometimes the efforts are focused within the university at the educational processes itself. In these situations, the challenge is to prepare students to participate in boundary-spanning research and action.

In this third installment of a series of articles on transdisciplinarity in higher education, we considered the status of transdisciplinarity in the European Union, as exemplified in both German and Austrian contexts. We wanted to discover, “*What is the nature of any activities that are currently underway? What are the challenges and successes of such efforts? How are participants addressing the challenges?*” To begin to answer these questions, we contacted two renowned scholars, Yahuda Elkana and Helga Nowotny. Both attended a May 2010 meeting in Berlin about the changing structures of the 21<sup>st</sup> Century University in Europe and attendant curriculum policies. Robert Page from ASU brought this meeting to our attention. The premise of the meeting, on the heels of the [Bologna Process](#), was that higher education serves society in many ways, yet perhaps not in enough ways. Our conversation with Elkana about the Berlin meeting led us to an Austrian initiative led by Andreas Muhar, also discussed in this article.

### Germany

The focus of the Berlin, Germany meeting was not on transdisciplinarity, per se, but on the infrastructure that fosters boundary-crossing, collaborative approaches between university participants and stakeholders outside the walls of the university. Based on the premise that interdisciplinary training is not enough, those in attendance entertained the question of what an integrated approach to curricula would look like so that students can learn to integrate across the disciplines of science and the humanities in their social contexts. A third discussion focused on non-government organizations and private foundations. The 14 participants

included two university presidents, representatives of the European Union and several science councils and foundations, as well as officials from science councils and foundations in the United States and representatives of Arizona State University (see McGregor and Volckmann (2010) for an overview of transdisciplinarity at ASU).



### **Yahuda Elkana**

Prof. Yahuda Elkana provided the introduction to the Berlin workshop/meeting along with Robert Page (ASU). Elkana was the former president of Central European University in Budapest. He has had an amazing life ([http://en.wikipedia.org/wiki/Yehuda\\_Elkana](http://en.wikipedia.org/wiki/Yehuda_Elkana)), which deeply informs his approach to higher education. He and his family escaped the horrors of Auschwitz when they were transferred by the Germans to Austria to work on reconstructing war-torn cities. He went on to become a prominent historian and philosopher of science. His writing shows his long interest in social issues (*Unraveling Ties: From Social Cohesion to New Practices of Connectedness, Resolving International Conflicts, and Capacity Building in Economic Education And Research: Lessons Learned And Future Direction*).

The first book listed above was produced as a result of a research project that was, at the very least, multidisciplinary as well as multicultural. As he stated in the introduction, scholars came from a variety of countries, such as Canada, China and Mozambique, and they represented a range of disciplines, including political science, linguistics, medicine, economics, materials science, anthropology and history. They sought to address a number of issues, such as the impact of the loss of vocation work on social cohesion; whether our current institutions for knowledge production support essential problem solving; the role of technology and the desired impact of public and private domains; and, the relationship between work, knowledge and social cohesion. Participants were challenged to draw on their diversity with attention to values and worldviews.

As we conversed with Elkana about the 2010 meeting in Berlin, he clarified that its focus was primarily on the development of curriculum policy in Europe as higher education enters the 21<sup>st</sup> century. Elkana remarked that, while the U.S. has some experience in this area, there seems to be an absence of curriculum policy in Europe. The major point of this meeting was that curriculum policy influences research and the focus of research is a policy concern. In order to attend to the complex issues facing us today, curriculum policy needs to support research that can attend to these issues.



### **Helga Nowotny**

Helga Nowotny was one of the attendees at the Berlin meeting. She facilitated a discussion of the role of science agencies for higher education, balancing off the previous day's discussion on new curricula for the natural and social sciences and the humanities, in their socio-political context. She is President of the [ERC](#), the European Research Council. She is also Chair of the [Scientific Advisory Board, University of Vienna](#), Professor Emeritus of ETH Zurich in Social Studies of Science where she was also Director of the Collegium Helveticum and of "[Society in Science: The Branco Weiss Fellowship](#)". From 2001-2005, she was Chair of [EURAB](#), the European Research Advisory Board of the European Commission.

We had an opportunity to pose several questions to her about the challenges of creating relevant university curricula that can scaffold transdisciplinary-informed research designed to address the complexity of the prob-

lems faced by humanity. Here are our questions and her responses (we thank her for taking time from her busy schedule to talk with us):

**ILR:** Universities are confronting the challenge of being relevant to their communities, nation states, the world. At the same time, the complexity of the research challenges in the world defy disciplinary silos operating independently in many cases. The challenge of providing approaches that transcend and include these silos are still relatively few and far between. Your interests and activities have been quite varied and you have achieved much. Your interest in sociology, time, the sciences all suggest that you have embodied principles of transdisciplinarity, even in your own life. How is this an accurate statement about your career?

**Nowotny:** *It is an accurate statement insofar as my personal career started in law, and then shifted to sociology, and finally I became a member of the emerging field of “Science and Technology Studies.” But what was probably even more important for my perspective in science and scholarship was the fact that I held positions in very different parts of the U.S. and Europe. Apart from working inside academia, I always have had an interest in policy aspects related to science, research and even innovation. That interest gave me a deeper understanding of the relationship between science and society.*

**ILR:** What principles/approaches to transdisciplinarity do you see that would be useful in the world of higher education?

**Nowotny:** *The key word, I believe, is bottom-up. Closely related to this suggestion is that the persons involved must gain a shared understanding of the kind of problems they want to tackle. I would, therefore, say that without a joint problem formulation, there cannot be any genuine transdisciplinarity. We cannot control creativity; we can only allow it to find its way. Here is the crucial link between science and society: Only a liberal society is open to new approaches in science. Vice versa, curiosity is the driving force that makes researchers tackle societal problems. [Note her recent book, **Insatiable Curiosity: Innovation in a Fragile Future**.]*  
**ILR:** What efforts are you aware of in German-speaking cultures to meet this challenge through transdisciplinary approaches?

**Nowotny:** *The German-speaking countries have a long tradition of university and intellectual development. But from the institutional point of view, the German university system did not adapt to the changes that took place during the 20<sup>th</sup> century, strangely enough. The universities in the U.S. are not only much more diverse but also are more flexible.*

*Having said this, I would like to add that I really appreciate the “[Exzellenzinitiative](#)“ in Germany [Note: The Excellence Initiative of the Federal and State Governments to promote science and research at German universities]. This program is a step in the right direction that, by the way, explicitly asks for transdisciplinary approaches.*  
**ILR:** How are you engaged in these efforts?

**Nowotny:** *In the German-speaking countries not too much, to be honest. I am asked for advice, and sometimes I am asked to serve on an advisory board for a university, but in general, my main focus is on the European level. The European Research Council (ERC) established a research funding institution that, for the first time, completely transcends national borders. To be the president of this institution is a great and challenging honor. Because its mission is to fund excellent research at the frontiers of knowledge, the ERC supports projects that are multi- and transdisciplinary.*

**ILR:** What are the barriers to success of these efforts?

**Nowotny:** *The main obstacles to our work are different academic cultures in Europe. But, in some respect, the bureaucracy of the European Union is also an obstacle.* **ILR:** How are you and others you know addressing these barriers?

**Nowotny:** *The ERC tries to establish a role model that is not only much simpler than most of the other European (and national) instruments to fund research but is also bottom-up. And, as I said before, to gain a common understanding of what transdisciplinary actually means, bottom-up is key and so is the willingness and ability to engage with exciting new scientific developments outside one's own narrow field. We simply don't care to which discipline or to which theoretical approach a specific research project belongs, as long as it is truly excellent and promises to make a difference at the border of what is known and what is not yet known. We are convinced that, at least indirectly, many of these problems will turn out to be relevant for society as well.*

**ILR:** In particular, what sorts of academic leadership do you see in higher education in German-speaking cultures to build toward transdisciplinary approaches, both in research and education?

**Nowotny:** *The same as in every other developed country of this world: enlightened professionals who believe that science and society are not to be separated, but should stand more closely together.*

## Austria



**Andreas Muhar**

The focus on research and the use of transdisciplinary approaches is central to addressing real world issues; however, building effective approaches is more than a question of disciplinary boundary crossing. It also is about the challenge of how to make such efforts bring value added. These efforts require mutual understanding and commitment to working together, something Franz-Xaver Kauffman (2002) calls *Bindung*, a German word that implies bonding in human relationships and that embraces attachment, cohesion, integration and morality. To that end,

Yehuda Elkana suggested we also might benefit from speaking with Andreas Muhar from neighboring Austria. He is the Head of the [Institute](#) of Landscape Development, Recreation and Conservation Planning at BOKU University of Natural Resources and Applied Life Sciences in Vienna, Austria. Included in the resources for this article are references to material about the work of his and his colleagues in the Luben 2014 project. This project was particularly interesting in that it brought together students from three German-speaking regions: Germany, Austria and South Tyrol in Italy.

One of these articles (Muhar et al 2006) focuses on the approach used in their work in the Leben (Life) 2014 project.

In the polarity field approach, the development challenges of a region are identified in a participatory process and grouped according to underlying polarities that form the thematic focus of workgroups. In this process seemingly isolated topics can be placed into a common viewing frame.

In Leben 2014, a comprehensive transdisciplinary case study conducted in the Austrian region of Oberpinzgau, Salzburg, six polarity fields (i. e., “wilderness and culture”, “single and together”, “inside and outside”, “tradition and innovation”, “fast and slow”, “young and old”) were identified as thematic frames for structuring the planning process. Working on polarity fields rather than sectoral topics stimulated innovative outcomes, as it brought together actors

who had not communicated much before. The polarity field concept seems to be a promising framework in particular for informal planning and sustainability processes at a regional level.

These scholars continue:

The term polarity field was chosen because it lacks the negative connotation embedded in terms such as tension field or conflict field. Both in Western and Eastern philosophy, the existence of polarities is often seen as a necessity for the functioning of systems on different scale levels (e. g., the “Yin/Yang” concept in Chinese philosophy or the “polarity therapy” concept as a Western approach...). The identification of polarity fields means consciously adopting apparent contradictions and searching for linkages or inseparabilities between them. In this process, seemingly isolated topics can be placed into a common viewing frame, which relates well to the integrative character of sustainability...

The polarity field approach specifically addresses not only the poles themselves, but also the wide range of perspectives between the poles, thus avoiding blockades resulting from seeing poles as dichotomies with a hierarchical character, where a “better” or “stronger” pole is seen opposed to a “worse” or “weaker” pole. Rather, a negotiation process is initiated, which aims at integrating different perspectives.

The article tells some of the story about a transdisciplinary effort in a relatively rural and picturesque Alpine region of Austria. Essentially, this is a research program in cultural landscaping that involves regional planning and sustainability processes. They were exploring the question of what the region would look like in the future, given the pressures of development in Austria. A transdisciplinary team of teachers and students from the University engaged with interested citizens in a participatory research process that involves a dialogue between science and society. The University team includes researchers from the geography, sociology, communication sciences, landscape planning, landscape agriculture, forestry.

The central question was, “How shall landscape, land use, and society in the Oberpinzgau region appear ten years from now?” A goal for the researchers was to develop a model for transdisciplinary cooperation between the university and regions in Austria. The primary goal of regional participants was to stimulate a regional dialogue as a step towards a formal statutory Regional Development Plan. “Transdisciplinarity in this context was understood as a transgression of borders between science and society with the goal of joint problem solving. This implies active participation of stakeholders in all process phases from the development of research questions to the assessment of results, including the evaluation of the research process itself.” (Muhar et al 2006)

Muhar indicated there is a tradition for departments to work together at BOKU University. Their arrangement is quite different from that found at ASU, however, where transdisciplinary efforts are institutionalized structurally. The transdisciplinary activities we discussed at BOKU were based on receiving grants from government(s). When asked about collaboration with private enterprise corporations, Muhar explained that, although there is an assumed values divide between the University culture and that of companies, there is a tentative effort underway to explore this interface.

Muhar clarified that collaboration in the BOKU project is with local citizens, including locally-elected officials and interested citizens from the communities being researched. There is no guarantee that all stakeholders will be represented; however, some efforts at bringing a dialogic process have been successful. Generally speaking, the participating stakeholders share values with the researchers regarding community, cooperation, sustainability and ecological safeguards. Nevertheless, finding a common language is a challenge. “Finding a common language...means more than finding the right words: it means to discover that diversity forms the

basis for transdisciplinary cooperation.” (Muhar 2006) In order for such a common language to be discovered, academics must rethink how they interact with society. Essential to this is self-reflection for the purpose of integrating diverse perspectives and approaches. This requires empathy on the part of the academics, the ability to see the world through the lenses of others.

These transdisciplinary projects begin with a planning retreat attended by participating researchers. It is critical that these individuals, from multiple disciplines, develop a shared understanding of the nature of the project and grow their capacity to communicate and share data and information across traditional disciplinary boundaries. Building relationships is important in that “all participants should have a chance to meet and get to know each other and to learn about their feelings and ideas. The activities for establishing personal relationships should not go too far, chumming up with regional actors will not produce the required result of an equal and deliberate relationship between all participants.” Nevertheless, communications capabilities also must extend to the relationship with project stakeholders in the community [Note: this approach is akin to Nowotny’s bottom-up principle].

Networking is essential to forming relationships with regional stakeholders. The goal is to include people with diverse perspectives. The outcome of this is that the network created will not be identical with local and regional decision-making structures. At the same time it is important that project researches maintain equidistance from all political parties in order to avoid even the perception of cooptation.

Decision makers in regions are mostly members of political parties or organisations with political background. Without the support of these decision makers, transdisciplinary processes are likely to have limited relevance for a region, in particular when it comes to the implementation of results. The consequence is to build up close cooperation with the mayors and other political representatives over the whole project period. Care has to be taken that all relevant political parties and organisations in a region are invited to join the process. Also speakers of politically less-represented interests and small groups are to be included in the process. (Muhar et al 2006)

A key goal of the project was to develop a model for cooperation between the university and local and regional stakeholders. This model would exemplify the transdisciplinary approach:

Leben 2014 was embedded in the International Transdisciplinarity Net on case studies for Sustainable Development (ITdNet; [www.uns.ethz.ch/translab/ItDNet/](http://www.uns.ethz.ch/translab/ItDNet/)), which brought together similar projects from different countries, drawing on experiences in particular from the case study methodology as developed at the Swiss Federal Institute of Technology (ETH) Zurich...

The overall project methodology was based on the scenario technique... Students, teachers and local actors should jointly develop scenarios for the region and implementation projects with a time perspective of ten years from 2004, hence the name “Leben 2014”.

Muhar acknowledged there is a challenge in measuring the success of this and similar projects. For example, it is difficult to say who or what is responsible for development and achievement in communities that are partners in the BOKU transdisciplinary initiatives. Communities may be able to achieve the same things without the participation of the University researchers. Furthermore, Muhar observed that, in their experience, trans-

disciplinary research does not always lead to more novelty, but to consensus. This result may mean there is an inverse relationship between innovation and consensus (i.e., the less innovation, the more consensus). Also, perceived outcomes for participants from different disciplines may vary. For example, participants from one science may experience a loss of relevance and importance in the projects if their perspectives are seen to be overshadowed by those of other sciences.

In addition to the research projects, BOKU is generating advanced degrees in sustainability, both an MA and a PhD. This year, 16 are completing their PhDs. Thus, the preparation of academics is an important ingredient in the Leben 2014 Project. Muhar and his colleagues explain it this way:

A key for successful transdisciplinary cooperation is the integration of non-academic actors at an early stage of the project. Important principles are the implementation of a structure of communication and networking in the case study region and the definition of rules of collaboration. The establishment of personal relations and network building is indispensable in order to guarantee a constant and broad exchange between all participants. Joint decision-making processes are essential for stable cooperation, which includes a joint problem definition process at the outset of the case-study phase as well as joint responsibility for decisions and joint ownership of ideas during and after the case-study phase.

Practical implications – Transdisciplinarity in case-study teaching also requires thorough preparation of academics. A constant discussion of different approaches to inter- and transdisciplinarity, the adaptation of existing conceptual frameworks to the specific requirements of the current case, the building of a committed teaching team and joint teaching of classes are all important. The careful selection of students and their specific preparation with respect to methodology and content are prerequisites for a successful outcome of a transdisciplinary case study. (Muhar et al, 2006)

Subsequent articles in this series will demonstrate that issues of sustainability lend themselves most readily to transdisciplinary approaches. In any case, it seems as though the technical capacity of those from varied disciplines to work together is a relatively small challenge, compared to their capacity for communication and teamwork (i.e., the relational aspects of transdisciplinary scholarship). In the case of the BOKU University project, two faculty members left the project because they did not enjoy the conversations (i.e., the debates) that took place among participants.

Clearly, experiences in the European Union have revealed that transdisciplinary approaches in higher education are as much about relationship dynamics as they are about knowledge interfaces and synergistic exchanges. The BOKU project especially demonstrated this point. It is apparent that this aspect of transdisciplinary scholarship must be well managed.

It will be interesting to track any progress stemming from the Berlin meeting, which focused on the future structure of higher education curriculum policy relative to the needs of the 21<sup>st</sup> century. The development of higher education curricula (especially that designed to foster transdisciplinarity) hinges on inter-sector conversations and emergent relationships. In addition, at least in the case of the BOKU project, the current financial crisis threatens the availability of grants and funding to support transdisciplinarity scholarship within higher education. This reality has emerged as a key difference between ASU and BOKU. ASU has no lack of financial support from the private sector even in the face of potential diminished support from public monies; these are being augmented by federal grants (McGregor & Volckmann, 2010). While BOKU is dependent on

government funding, ASU has been thriving through partnerships with private industry. In future articles, we hope to see how these and other patterns become clearer. Stay tuned. Next, we travel to South Africa.

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