Summary of the Proceedings

# Learning by Doing – Making Interdisciplinarity Work

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## Introduction

In early 2013, around 100 academics, administrators and policymakers gathered in Brussels for a conference examining interdisciplinarity in European research. As the European Union continued its negotiations toward Horizon 2020 (the EU's next Framework Programme for research), the conference explored the challenge of integrating Socio-economic Sciences and Humanities (SSH) more effectively into the EU's broader research matrix.

Featuring presentations from over a dozen experts, the conference highlighted lessons learned from interdisciplinary research projects funded under the EU's Seventh Framework Programme (FP7). The one-day conference provided a valuable overview of obstacles, opportunities and good practices connected with SSH involvement in EU-funded interdisciplinary research.

**Learning by Doing: Making Interdisciplinarity Work** was organized by NET4SOCIETY, an EU-funded network of SSH National Contact Points. The moderator for the day was Rudiger Klein, founding chair of the European Alliance for the Social Sciences and Humanities. The conference rapporteur (who prepared this report) was Terry Martin, director of the science-policy interface agency SPIA.

*The results of the conference will feed into a policy brief Net4Society is preparing on the issue of mainstreaming SSH throughout all parts of Horizon 2020.*

## From ideal to reality: Putting it into practice

Opening the conference, NET4SOCIETY Coordinator Angela Schindler-Daniels reminded delegates that interdisciplinary is nothing new in EU-funded research. It played a role (however limited) in both the Sixth and Seventh Framework Programmes. She acknowledged that FP7 featured numerous cases of SSH researchers working together successfully with representatives of many other disciplines - medical doctors, engineers and environmental scientists, for example, some of whom would be speaking at the conference. And she noted that SSH research is itself inherently interdisciplinary, a point that would be echoed by other speakers throughout the day.

However, Angela Schindler-Daniels argued that just because interdisciplinarity is part of EU-funded research does not mean that its potential has been properly recognized or exploited. In practice, she observed, interdisciplinarity remains more of an ideal than a reality. She called for SSH and interdisciplinarity to be embraced more fully in Horizon 2020, utilizing their unique capacity to address societal challenges. This being said, Angela Schindler-Daniels emphasized that interdisciplinarity should not be seen as an end in itself. It is not a 'one-size-fits-all' approach to research, she noted, but rather an avant-garde and high-risk endeavour that must be cultivated appropriately.

## Obstacles: Interdisciplinarity is as hard to practice as it is to pronounce

Despite general agreement that major societal challenges - e.g. those concerning employment, health, security and the environment - can best be tackled using an interdisciplinary research approach, those wanting to adopt such an approach face many obstacles. As Philippe Keraudren, deputy head of the SSH unit at the European Commission's research directorate, succinctly put it in his keynote address: 'Interdisciplinarity is not an easy exercise'.

**10 obstacles to interdisciplinary research identified during the conference:**

1. Many scientists dismiss interdisciplinarity out of hand, claiming it is a waste of time (antipathy).
2. It is difficult to build a career on interdisciplinarity (journals and faculties tend to be *mono*disciplinary).
3. Interdisciplinarity challenges the 'silo' structure of academic institutions.
4. Interdisciplinary research is more time-consuming than other research (one has to come to terms with different mind sets and methodologies).
5. Research administrators have difficulty identifying topics/fields that lend themselves to an interdisciplinary approach.
6. Evaluation of proposals is not geared toward recognizing or rewarding interdisciplinarity.
7. Few evaluators are capable of properly assessing the interdisciplinary merits of a proposal.

8. Researchers have little (if any) knowledge of how to build interdisciplinarity into a proposal or how to implement it in work packages.
9. Interdisciplinarity often ends up getting clumsily 'tacked on' to topics and proposals due to lack of experience/knowledge; this often leads to poor results with the disciplines operating in parallel instead of together. (Experience shows that attempts at interdisciplinarity frequently become *multi*disciplinary.)
10. Ideological divides (different schools of thought) prevent some researchers – especially within the social sciences – from cooperating effectively.

## Beyond disciplines: A UK case study

Examples of research funding organizations fully embracing interdisciplinarity are rare. One of these exceptional entities is the UK's Economic and Social Research Council (ESRC). Adrian Alsop, director of research at the ESRC's Partnerships and International Directorate, explained how interdisciplinarity has been integrated into the ethos of the UK's largest funder of research on economic and social issues.

'As a matter of choice, the ESRC has no disciplinary structure', Adrian Alsop told the conference. And there are two reasons for this: first of all, 'disciplines are social constructs', he said, and should not be regarded as fixed. But more importantly, he explained, the Council's experience has shown that 'impacts are greater *with* interdisciplinarity'.

The fact that disciplines are social constructs does not mean they are without power, he cautioned. Indeed, Adrian Alsop acknowledged that other forces are continuing to push towards mono-disciplinarity. He argued, however, that if quality and impact are recognized as key values - and interdisciplinary research can deliver those - who can argue against it?

Adrian Alsop imparted how the ESRC's approach is underpinned by a relatively new mode of knowledge production that is problem-oriented, trans-disciplinary and based on co-production. This so-called 'Mode 2' approach[1] is contrasted with a more traditional approach that is discipline based and involves an academic monopoly of knowledge production.

The tension between these modes of knowledge production, he said, was demonstrated through the experience of an FP6 project aimed at 'Changing Knowledge and Discipline Boundaries'. [2]Adrian Alsop recounted how it was initially assumed that researchers and administrators needed just a few basic qualities in order to carry out interdisciplinary research effectively. These included: good interpersonal skills, good communication skills, openness to other methods and terminology, and a willingness to work towards developing a common language. However, it soon became clear, he said, that the academic incentive system

[1] Described in the 1994 book *The New Production of Knowledge – the dynamics of science and research in contemporary societies,* Helga Nowotney et al.
[2] EU-Project „Research Integration - Changing knowledge and disciplinary boundaries through integrative research methods in the social sciences and humanities" funded under *FP6*-CITIZENS. Project website: http://www.york.ac.uk/res/researchintegration/

(tenure/promotion through publishing in mono-disciplinary journals) formed a barrier to interdisciplinary progress.

Adrian Alsop expressed the hope that radically new publication patterns enabled by open access could prove helpful in addressing this stubborn obstacle. And he suggested that the European Commission had the opportunity to play a decisive role in challenging mono-disciplinarity by promoting open access.

Finally, the ESRC representative offered **5 concrete suggestions for promoting interdisciplinary research**:

1. Fund preparatory stages & pilot projects.
2. Fund over a sufficient period.
3. Robustly decline disciplinary projects unlikely to address challenges.
4. Referee carefully to identify novelty in combination of disciplines.
5. Evaluate excellence with impact on completion of research.

## Multi-, inter-, or trans-disciplinarity?

John Doling of the University of Birmingham related his experience with DEMHOW, an interdisciplinary FP7 project dealing with demographic change and housing wealth.

He began by differentiating between the following terms that are often confused in discussions addressing disciplinary boundaries:

**Multi-disciplinary**

- Each discipline attempts to explain the same phenomena from its own viewpoint.
- Independent stories.

**Interdisciplinary**

- Looks at same phenomena from different viewpoints but tries to integrate the explanations.
- Connected stories.

**Trans-disciplinary**

- Draws together theories and approaches to form a shared conceptual and analytical framework – a new discipline.
- Integrated story.

John Doling observed that making connections across disciplinary boundaries is most difficult where disciplines 'have fundamentally different views of the world (e.g. positivism vs. constructivism).' And he repeated the often-heard lament that 'individual researchers may be ignorant of, and devalue, other disciplines'.

John Doling concluded by offering several **practical tips for those involved in interdisciplinary research projects**. While extolling the virtues of adaptability, flexibility and open-mindedness, he encouraged coordinators to:

- Consider partners with policy/practice orientation.
- Involve key members in devising questions, objectives, methodology and publication strategy (coherence).
- Arrange frequent face-to-face meetings with space for all disciplines (money/time).
- Show strong leadership when required.

Repeating calls from other speakers for more carry-through in EU-funded research, Antonia Trichopoulou of the Hellenic Health Foundation described the challenges encountered by the CHANCES project on Health and Ageing. Combining large amounts of data from different cohorts, CHANCES illustrated the difficulties of integrating diverse data sets originally shaped by different disciplinary approaches. Antonia Trichopoulou also highlighted the separate but related problem of implementation of findings after a project finishes. She decried the fact that important interdisciplinary projects like CHANCES often generate important results without any provision being made for further exploitation.

## Thinking outside the box

Torbjörn Svensson of Lund University provided insights gained through the FUTURAGE project, an FP7 effort aimed at developing A Road Map for European Ageing Research. The project serves as a successful example of interdisciplinarity in practice.

Featuring 'full engagement with key non-academic stakeholders in ageing research', the project defined its priorities through an '**iterative process of extensive consultations'**, Torbjörn Svensson explained. He said over 300 persons representing no fewer than 26 separate disciplines were involved in the consultative process that led to the creation of 4 working groups. Torbjörn Svensson explained how the project sought to integrate interdisciplinarity into (and across) all work packages, carrying it all the way through to the writing and proofing process. The presence of young people in the project, he suggested, was very helpful in 'thinking outside of the box'. Also helpful was the fact that the project design was largely user driven. Cross involvement among work package leaders, Torbjörn Svensson said, was extremely useful in assuring that the interdisciplinary mode of operation carried through to the end of the project.

## Moving together, moving apart

Andrea Ricci of the Institute of Studies for the Integration of Systems in Rome related his experiences with a number of interdisciplinary efforts involving transport, energy and the environment. Despite his extensive background bringing different parties together (SSH researchers together with natural scientists, policymakers with citizens, etc.), he said that when it comes to interdisciplinarity, 'translating good intensions into design is still murky'. Like many speakers at the conference, he emphasized the need to involve relevant stakeholders along the entire decision-making process.

Andrea Ricci suggested that one of the most fundamental barriers in interdisciplinary research is when objectives in a project are not aligned - for example, when one part

of a consortium is fixated on achieving scientific progress while the rest is focused on societal problem solving.

Lessons on what *not* to do in interdisciplinary projects were provided by several speakers during the conference. Lydia Vamvakeridou-Lyroudia (University of Exeter) and Fabrice Renaud (UN University) reported how an interdisciplinary 'cluster' template was superimposed on a group of projects that had not been conceived with that final construct in mind. The resulting problems included: insufficient resources to accommodate inter-project cooperation, lack of a common stakeholder panel and no possibility to adapt case studies appropriately. The speakers suggested that the cluster ended up with 'three different approaches but no fully implemented interdisciplinary approach'.

## A clutch of obstacles

Nick Gotts, an independent researcher, provided a useful **summary of concrete barriers to interdisciplinarity** encountered in the GILDED project (Governance, Infrastructure, Lifestyle Dynamics and Energy Demand) which he coordinated:

- Absence of specialists in some of the disciplines at key points (energy technology studies, policy studies).
- Absence of at least one key discipline from the project proposal: economics.
- Exclusive concentration of a discipline in one partner (political science, software design).
- Unfamiliarity with other disciplines.
- Specialist vocabularies.
- Lack of time for *teams* to get to know and understand each other.
- Problems in devising a questionnaire that would cover all teams' requirements.

## Interdisciplinarity in security research

The vital importance of interdisciplinarity in security research was articulated in a panel session featuring representatives from several security-themed FP7 projects.

Sveva Avveduto related her experience with the project RESPECT (Rules, expectations and security through privacy-enhanced convenient technologies). She suggested that RESPECT demonstrated how difficult it can be to synchronize knowledge development from different disciplines with different time horizons and languages. However, RESPECT succeeded in this task by relying on the common goal and on a strong role of the coordinator.

Luk van Langenhove of the project EU-GRASP (Changing multilateralism: The EU as a global-regional actor in security and peace) noted the importance of agreeing on an epistemological/theoretical concept at the beginning of an interdisciplinary research effort. Not only *between* but also *within* disciplines there are sometimes deep divides between schools of thought, he observed, adding that project cycles are often too short to accommodate interdisciplinary research properly.

J. Peter Burgess shared his experience in a security-related project where SSH was originally included for political reasons to assure that legal and ethical aspects would

not be disregarded. But SSH integration into PERSEUS (Protection of European Seas and Borders through the Intelligent Use of Surveillance) ended up adding significant value. It led to new and important research questions being addressed, he explained. The project demonstrated SSH's usefulness in an interdisciplinary context, in this case for the task of conceptualising the research. J. Peter Burgess pointed out that engineers tend to focus on very specific tasks while SSH researchers are looking for the big picture.

## Interdisciplinarity goes international

Angela Liberatore of the European Commission's International Cooperation Unit made the case for strengthening interdisciplinarity and international cooperation. Arguing that the world is too complex for exclusively mono-disciplinary efforts, she asserted that these crosscutting dimensions should be beefed up between (and within) all programmes. Angela Liberatore concluded by pointing out that interdisciplinary knowledge is essential because of its capacity to address the fundamental question of 'Why?' Using the compelling topic of climate change to illustrate her point, Angela Liberatore suggested that only interdisciplinary research is capable of providing an informed response to questions such as 'Why do we need another international agreement to succeed the Kyoto Protocol'?

## Candid advice

As hoped, the conference yielded numerous suggestions on how Europe's interdisciplinary research efforts could be optimised. Here's a summary:

- *Build interdisciplinary into the project right from the very start.*
- *Integrate interdisciplinarity at all governance and project levels of the process (different disciplines and users).*
- *Implement interdisciplinary research funding on all levels of governance (regional, national, international).*
- *Create a panel with researchers and users of the research so that co-production of knowledge is represented at every level.*
- *Take a 'town meeting' approach, getting different people together to get a dialogue going from the onset.*
- *Avoid the 'add-on' approach (i.e. trying to tack interdisciplinarity on later in a project).*
- *Submit project deliverables to an internal interdisciplinary review.*
- *Approach the research programme itself as an exercise in co-creation. It is not enough to involve academics and administrators. You need to challenge them with the views of those who will use the knowledge (e.g. civil society organizations, policymakers, business people).*

- *Set aside more time for interdisciplinary projects; they are more time intensive.*
- *Allocate funds to assure that there are sufficient knowledge exchange pathways – these exchanges do not happen without resources.*
- *Do not draw boundaries between fundamental and applied research; it is much more fluid than that.*
- *Clarify key terms at the beginning of a project to help avoid disconnect ('linguistic terrorism'). If terms are contentious, agree on pragmatic usages to facilitate progress in rest of project.*
- *Consider applying scientific methods that have proven useful in interdisciplinary contexts such as agent-based modelling.*
- *Prepare yourself to be at least a little bit 'out of place' if you are to work in an interdisciplinary project*
- *If a member of the consortium proves he or she is not able to work in interdisciplinary environment, let them go.*
- *Leave space to consider and negotiate interdisciplinary interaction once the project has begun. (Sometimes calls/evaluations see this as a weak point.)*
- *Train scientists to be more 'integratable' into interdisciplinary projects.*
- *If you are aiming to address societal challenges use interdisciplinarity as the starting point.*
- *Create specific methodologies to develop and accommodate interdisciplinary research.*
- *Address the very human obstacles of trust and fear.*
- *Adapt the evaluation process - criteria and evaluators - to the realities of interdisciplinary research.*
- *Aspire to a more interdisciplinary mind set in general.*