

Socio-Technical Integration Research (STIR) Spanish Case Study

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Aims

- To understand:
 1. How natural scientists consider social aspects in their daily work.
 2. Which are the main uncertainties they have to face.
 3. How they can integrate the social aspects in their research.

Method

- Socio-Technical Integration Research (STIR) developed by Erik Fisher
- STIR is defined as “any process by which technical experts take into account the societal aspects of their work as an integral part of that work” (Fisher, 2007).

Opportunity	Considerations
Outcomes	Alternatives

3 cases

Case (country)	Radiation protection field
Laboratory of Environmental Physics, University of Tartu (Estonia)	Various (Radioecology; Applied Measurement Science; Atmospheric Physics; Analytical Chemistry)
Biosphere Impact Studies (BIS), Belgian Nuclear Research Centre SCK-CEN (Belgium)	Radioecology
Environmental Radioactivity and Radiological Surveillance Unit (URAYVR) (Spain)	Environmental radioactivity

- Territories Task 2.3 (WP3) led by Michiel van Oudheusden

Spanish Case Study

- The lab organization studied is the “Environmental Radioactivity and Radiological Surveillance Unit” (URAyVR).
- This unit is part of the Division of Radiological Environment of CIEMAT’s Department of Environment and develops its activity in three fundamental areas:
 - Research, Development and Innovation
 - Technical services
 - Training

Sample

- Two researchers are part of the STIR Protocol application:
 - Researcher 1 (PhD in Chemical Sciences. Head of Laboratory 4).
 - Researcher 2 (PhD in Chemical Sciences. Head of Laboratory 3).
- The Head of Unit was interviewed once only to obtain contextual information of the Unit.

Fieldwork

- From May 2018 to May 2019.
- Both researchers were interviewed once for introductory questions.
- “Researcher 1” was interviewed two times.
- “Researcher 2” was interviewed three times.

Midstream Modulation

- De facto – implicit interplay of social and technical considerations.
- Reflexive – becoming aware of social and technical considerations.
- Deliberate modulation – changes in decision making.

Topics appeared

- Funding
- Human resources
- Lack of objectives
- The future of the scientific system
- Lack of collaboration between departments
- Social visibility

Example of Modulation (I)

- De facto: not enough government funding.
- Reflexive: try to fight for themselves.

“The solution is very simple. Work for free and publish in scientific journals to become obvious.”

- Trying to find applications of their work in other fields and turn this into support techniques for other projects.

“Moreover, I think that what you have to look for are applications in other fields. See if they can be converted into support techniques for other projects.”

Example of Modulation (II)

- De facto: the patent system in Spain is full of obstacles, with a very long process needed to register a patent.

“In the United States, what they do is to set up a perfect, easy, agile and very simple patent system for scientists. Therefore, if I find something, I patent it.”

- Reflexive: in Spain there are very good scientists and very fresh ideas in science but usually are restrained by bureaucracy.

“Therefore, what is needed is the framework that originally set Zapatero's [former Spanish president] Science Act. We need to introduce it.”

The participant affirms that science in Spain is utopic.

“For example, the US system is based on the investigation, patent and earning money.”

Example of Modulation (II)

- Deliberate: he suggested that science has to be “sold”.

“If the public sees an income from science and private companies see, for example, that public entities are able to solve problems, they will finance public research. But if there is no such thing, there will be nothing.”

He suggests that a free patent system for the scientists could be economically profitable for the government and even become self-sufficient.

“If there is a patent system that is almost free for a scientist, then the Spanish Government could even earn money, then it can start to reinvest this money in science and it could even become self-sufficient.”

Challenges in Spanish Case Study

- Trying to immerse ourselves in a laboratory without being actually there.
- Understanding the nature of their work from our social sciences background.
- Achieving a good level of trust with the participants.
- Being clear and concise with our objectives in order they were fully understood.

Conclusions

- STIR sessions contributed to raise awareness of the social aspects involving natural sciences.
- The modulations showed a change of awareness and attention to the societal aspects involving their research.
- STIR sessions helped them to think more about these challenges and bring up solutions or changes.

THANK YOU

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