



# LEADERSHIP SCHOOL

Preparing Higher Education leaders to become the change makers of the university of tomorrow

## RRI in Strategy for the HE digital transformation

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Research

Innovation

Talent and scientific careers

Society

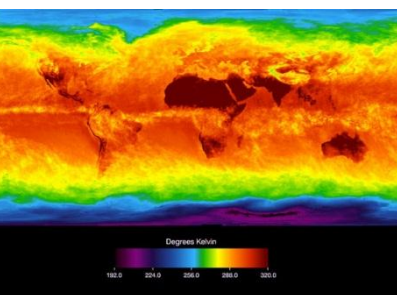




## What is Responsible Research and Innovation

"Responsible Research and Innovation is a **transparent, interactive process** by which societal actors and innovators become **mutually responsive** to each other with a view to the **(ethical) acceptability, sustainability, and societal desirability** of the innovation process and its **marketable products** (in order to allow a proper embedding of scientific and technological advances in our society)"

Von Schomberg definition, 2011





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- Current challenges of Science and society
- What is Responsible Research and innovation and how to apply it
- RRI at HE and the digital transformation.



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## Public & Scientist's Views on

**Science & Society;** *Pew Research Center. January 2015*

### ***Safe to eat genetically modified foods***

37%



51 point gap



88%

*Safe to eat*

37%

88%

63%

12%

*Unsafe to eat*



U.S. adults

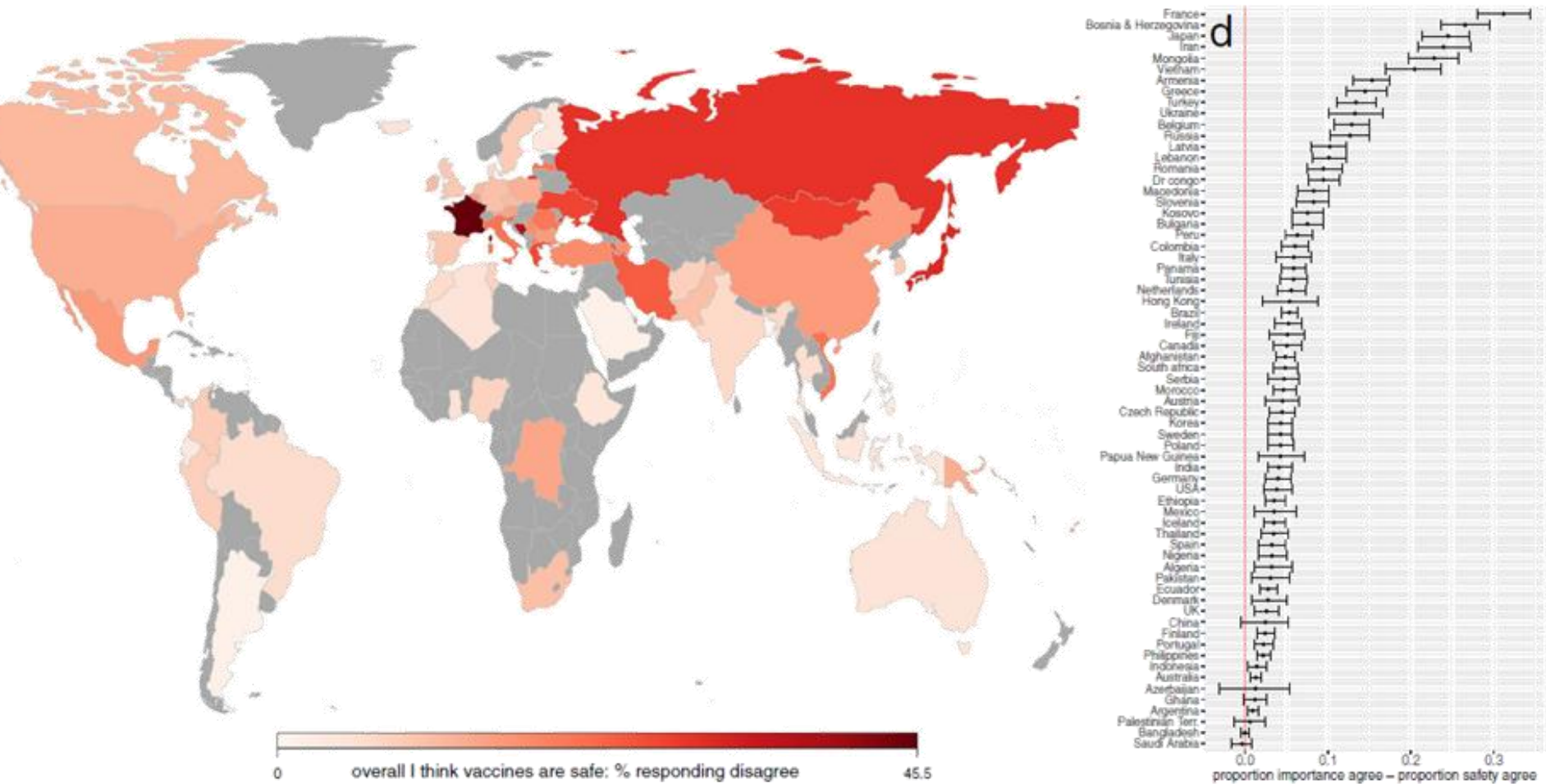


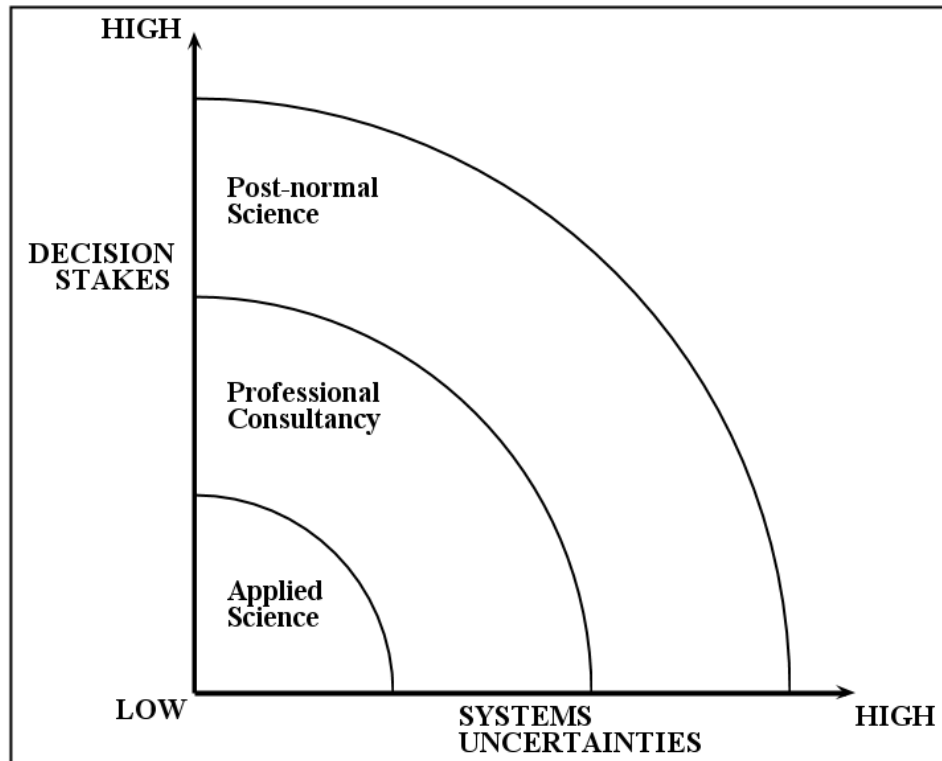
AAAS scientists





*Larson, H.J., et al., The State of Vaccine Confidence 2016: Global Insights Through a 67-Country Survey, EBioMedicine, (2016).*





Facts uncertain,  
values in dispute,  
stakes high, and  
decisions urgent.

Post Normal Science (Funtowicz  
and Ravetz, 1991, 1992, 1993)



## Ex-Post-Evaluation of the 7th EU Framework Programme (2007-2013)

- (a) Ensure focus on critical challenges and opportunities in the global context
- (b) Align research and innovation instruments and agendas in Europe
- (c) Integrate the key components of the Framework Programmes more effectively
- (d) Bring science closer to the European people**
- (e) Establish strategic programme monitoring and evaluation

**Rationale:** Increasing trust, acceptance, and ownership of research, and ensuring its relevance and creativity.

**Implementation:** Future Framework Programmes should involve stakeholders more in building an evidence driven and science based society of the future and integrate civil society organizations in a more substantial way (for example by their inclusion in evaluation panels or by particular partnership programmes). Citizens and stakeholders should be engaged in a dialogue about the purpose and benefits of research and the way it is conducted....





## Scientists and society are fostering new modes of participation



Collect data (*citizen science*)

- In astronomy, ornitology, environmental monitoring

Disseminate the results of R&I

- Journalists, museums...

Actively initialising research

- Science shops, patient organizations, ONG's

Research funders

- *crowdfunding*, patient organizations

Setting R&I agendas

- - ONG's, patient organizations, *trade unions*, *citizen meetings*

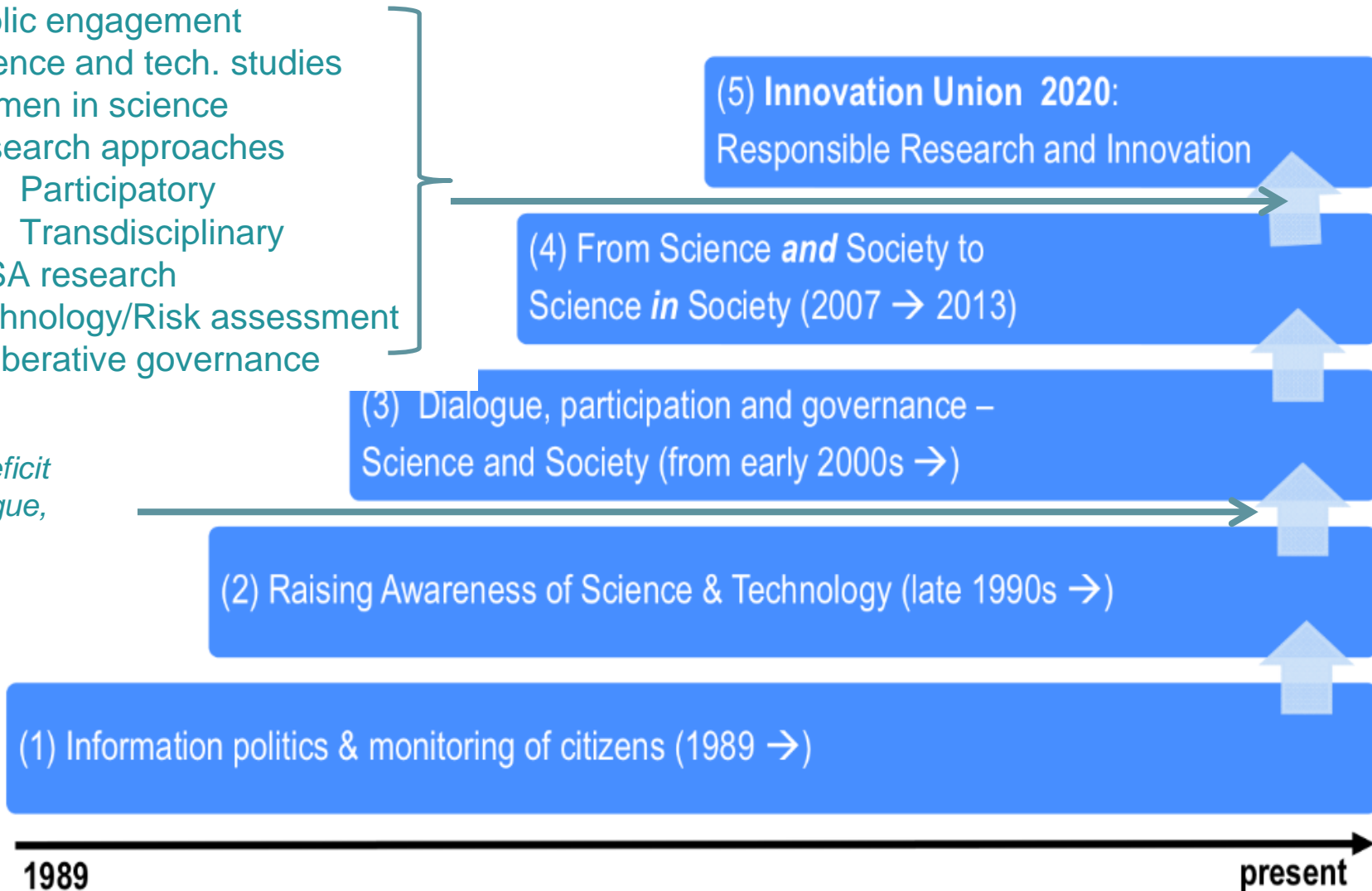
Supervising R&I

- Advisory boards and research ethic committee, representatives of local authorities in regional planning



- Public engagement
- Science and tech. studies
- Women in science
- Research approaches
  - Participatory
  - Transdisciplinary
- ELSA research
- Technology/Risk assessment
- Deliberative governance

From *deficit*  
to *dialogue*,  
*IBSE*...





## Gender in Research



Gender Balance in decision making

Gender balance in research teams

Gender dimension in the content of R&I

Between 1997 and 2000, 10 drugs were retired from the USA market because of their fatal risks to health. Eight of them presented “more risks to women’s than to man’s health”.

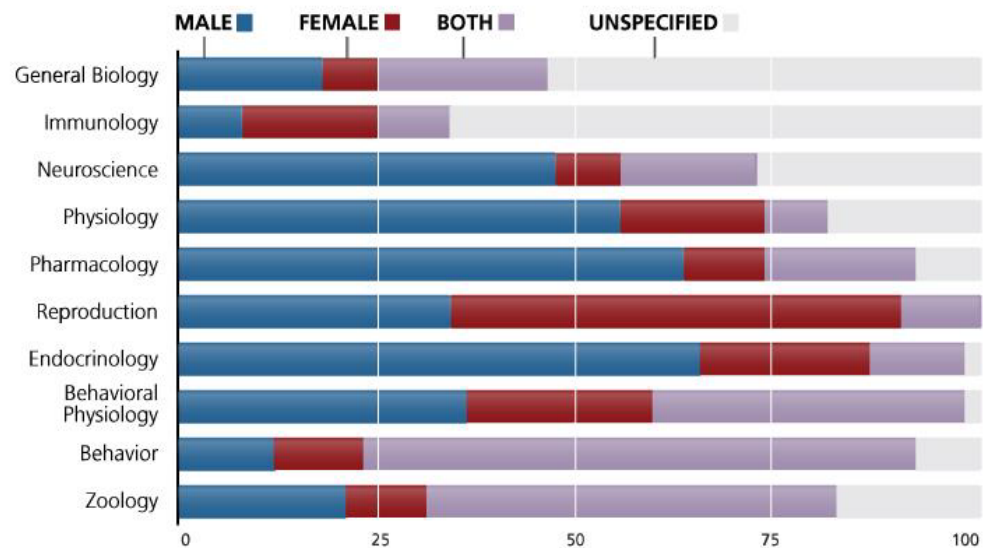
(US GAO, 2001)



## Underepresentation of female in studies with animals

### Proportion of Research Studies Using Male and/or Female Animals

From published journal articles within specified biomedical subfield, 2009



Adapted from Beery et al., 2011



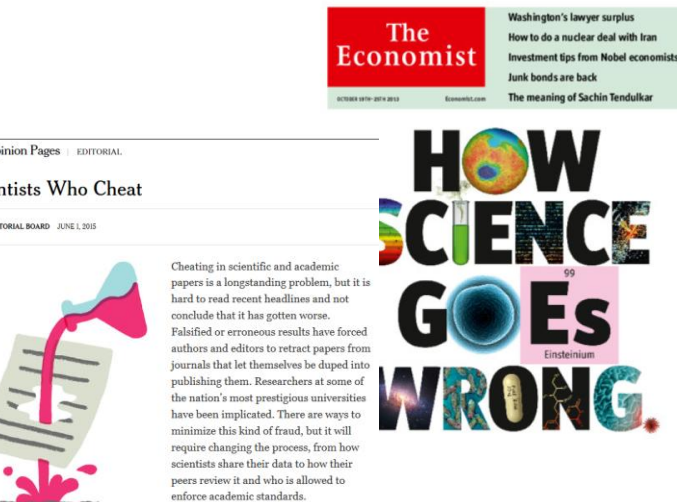
## Crisis of quality of science?

### Reproducibility and waste:

- “Currently, many published research findings are false or exaggerated, and an estimated 85% of research resources are wasted.”

Ioannidis JPA (2014) How to Make More Published Research True. PLoS Med 11(10): e1001747.  
doi:10.1371/journal.pmed.1001747

- “\$200 billion wasted in science in the US only in 2010”.  
Research: increasing value, reducing waste. The Lancet (2015)



The New York Times

**“Nine in ten people trust scientists to follow the rules. How many scientists would say the same?”**

Misplaced faith. The public trusts scientists much more than scientists think. But should it? *NATURE* EDITORIAL (June 2015)

### Fraud and misconduct

- “The scientific community clearly needs to build a better safety net”
- Scientist who cheat. Editorial. New York Times (2015)



Open access scientific  
publishing

All scientific papers to be free by 2020  
under EU proposals

**theguardian**



## The FAIR Data Principles:

- Findable
- Accessible,
- Interoperable
- Re-usable

Data management plans,  
Green and golden paths...





...that science should become an overtly public enterprise rather than one conducted behind closed laboratory and library doors, that publicly funded science should be done openly..... ,

Unesco Science report: Science for a sustainable and just world: a new framework for global science policy? Heide Hackmann and Geoffrey Boulton

(OECD) AGREEs that science, technology and innovation .... are changing the way scientists work, collaborate and publish; increasing the reliance on access to scientific data and publications ("open science"); opening new avenues for public engagement and participation in science and innovation "citizen science"; ...; contributing to the transformation of how innovation occurs ("open innovation").

OECD Daejeon Declaration on Science, Technology, and Innovation Policies

- The relationship between science and society is a very complex issue (alignment of values and needs of society with research, acceptability of new technologies, access to data and results, ownership and security of data, equality issues, etc.) and it is crucial for the legitimacy, trust and of R&I investment and for the mission of RFPO (including universities)



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# Definitions of RRI

## Von Schomberg

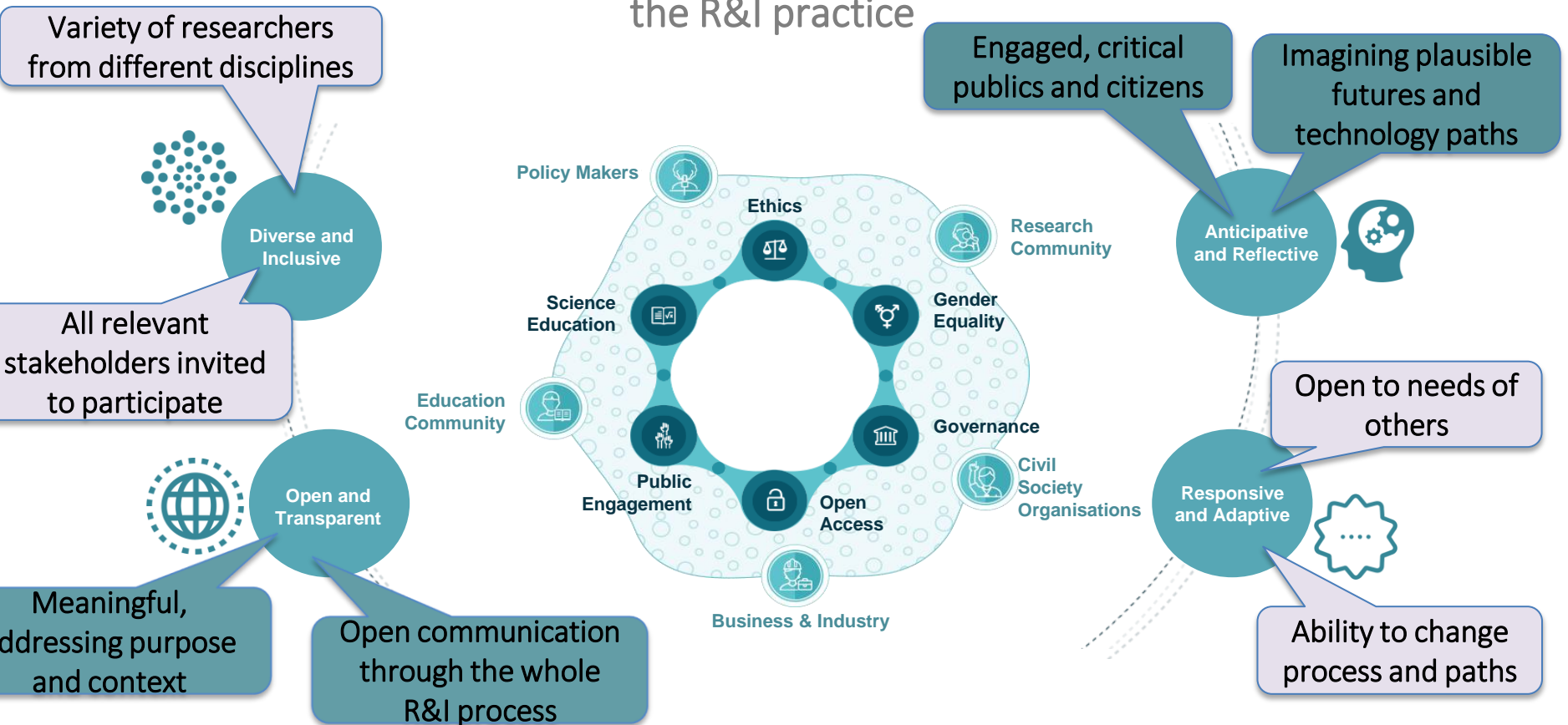
"Responsible Research and Innovation is a **transparent, interactive process** by which societal actors and innovators become **mutually responsive** to each other with a view to the **(ethical) acceptability, sustainability, and societal desirability** of the innovation process and its **marketable products** (in order to allow a proper embedding of scientific and technological advances in our society)"

## European Commission

- **Public engagement**
- **Gender equality**
- **Open access**
- **Ethics and research integrity**
- **Science education**

# What is Responsible Research and innovation

Responsible Research and Innovation (RRI) is about including all actors, considering specific key issues and integrating some process dimensions in the R&I practice



Working together towards ethically acceptable, socially desirable and environmentally sustainable products and services that address the grand societal challenges of our time

INNOVATIVE  
TOOLS

- 450+ resources
- 11 landing pages
- 28 application guides
- Self-Reflection Tool
- Available in 18 languages

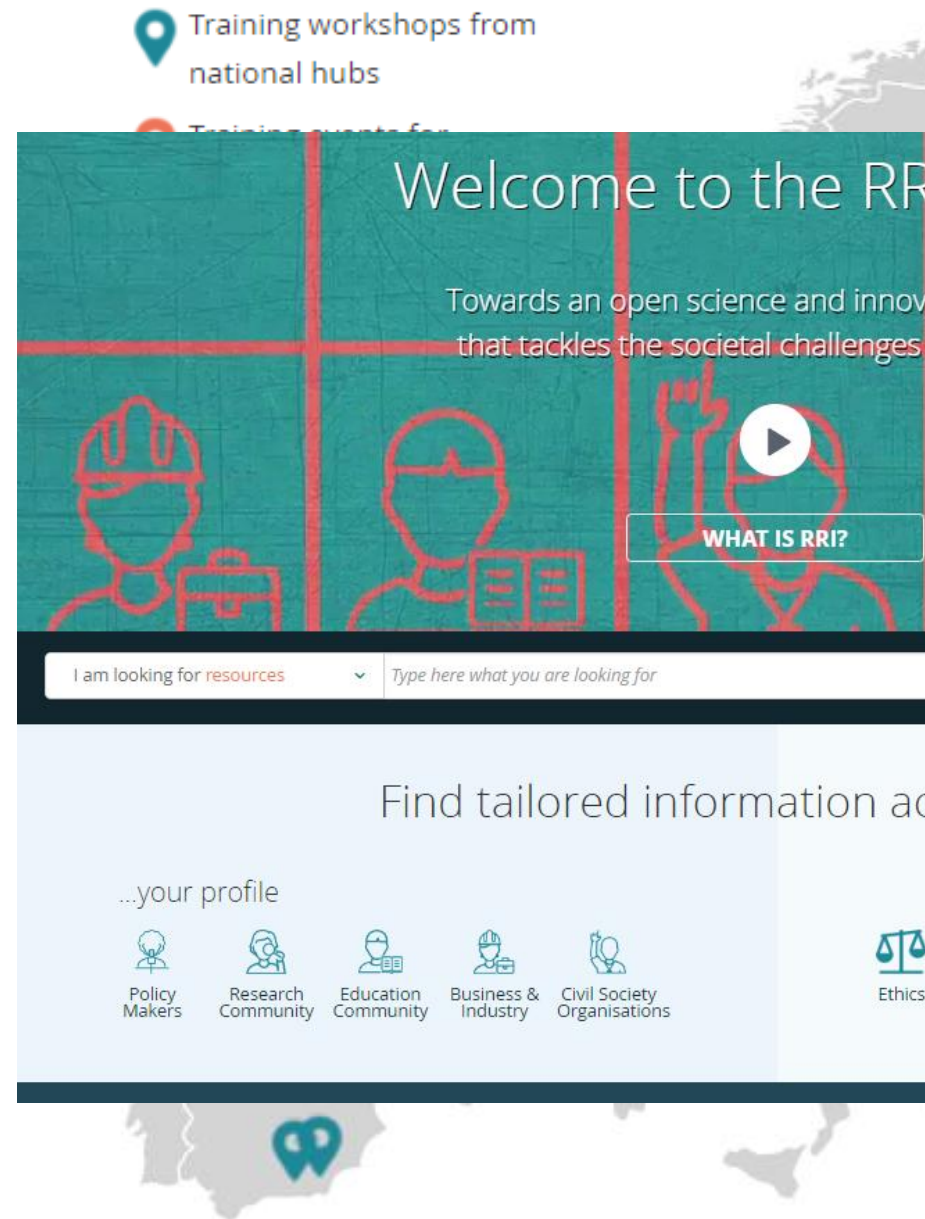
TRANSFORMATIVE  
TRAINING

- 19 RRI Hubs, 30 ERA countries
- 90+ trainings in 2016
- 400+ institutions engaged
- 4 modules, 8 showcases
- 25+ videos & presentations

WIDE  
DISSEMINATION

- 800+ Community members
- 170000 Toolkit visits (07/03-...)
- 3400+ followers in SSNN
- 100+ advocacy meetings
- 200+ participations in events

VIDEO







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**Higher Education Institutions  
& Responsible Research and Innovation**



Universitat  
Pompeu Fabra  
Barcelona

#### TOPICS:

- Engaging civil society at university: experiences and lessons
- Identifying good practices in higher education and RRI
- Training on research and innovation for industry: needs and challenges
- Innovative ways of teaching: risks and benefits of PBL
- Introducing gender into higher education
- Research for all? The hard shell of open access and open science
- What it takes to do RRI: knowledge and skills for the future generations



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- Current challenges of Science and society
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- **RRI at HE and the (digital) transformation.**
  - The importance of the 3rd mission
  - RRI can help
  - A couple of (digital) engagement



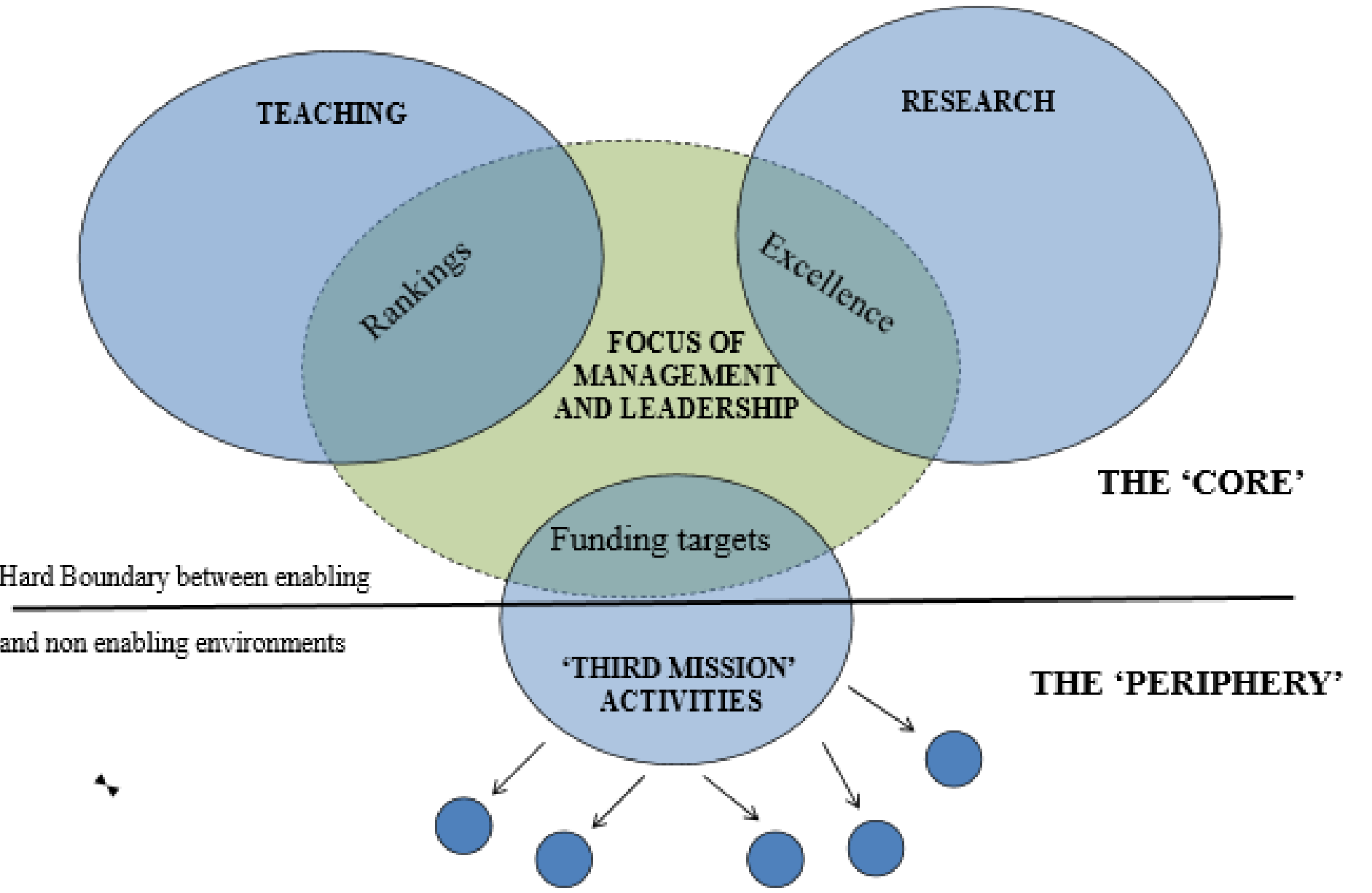
## The Civic University

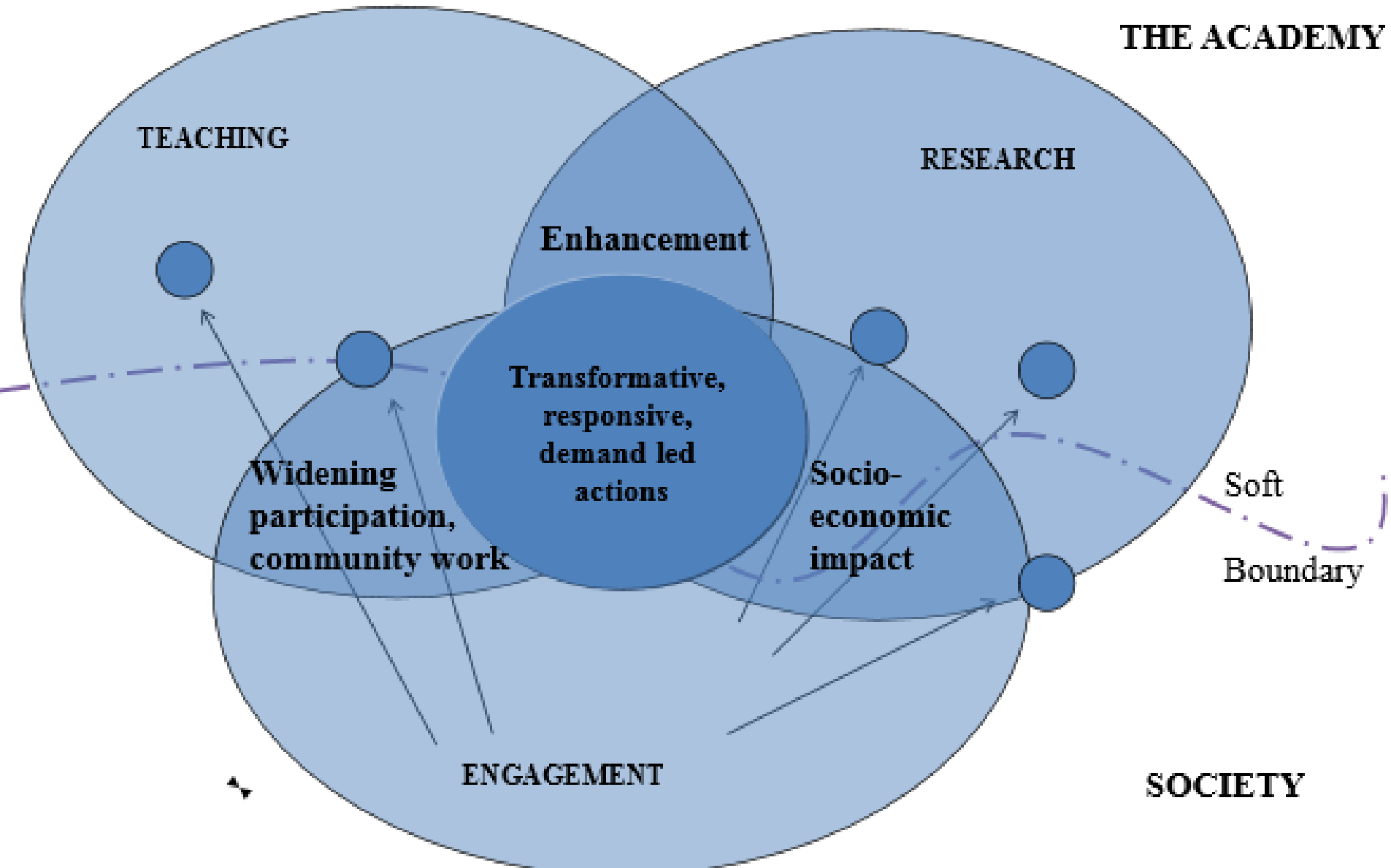
We must ask not just what the University is good *at* but what it is good *for*.

Putting academic knowledge, creativity and expertise to work to help make a difference to real world challenges

John Goddard  
Emeritus Professor of Regional  
Development Studies

# The 'un-civic' university







LERU'S INTERIM  
EVALUATION  
OF HORIZON 2020

## LEAGUE OF EUROPEAN RESEARCH UNIVERSITIES

University of Amsterdam - Universitat de Barcelona - University of Cambridge - University of Edinburgh  
University of Freiburg - Université de Genève - Universität Heidelberg - University of Helsinki  
Universiteit Leiden - KU Leuven - Imperial College London - University College London - Lund University  
University of Milan - Ludwig-Maximilians-Universität München - University of Oxford  
Pierre & Marie Curie University - Université Paris-Sud - University of Strasbourg  
Utrecht University - University of Zurich

**C.1.1. Towards Open Science**

LERU believes that open access (OA) to scientific publications and the optimal reuse of research data are vital for the development of open science. Given the importance of Horizon 2020 as part of the EC's role as a scientific funder, effective actions are essential in order to push open access forward

**C.1.2. Responsible Research and Innovation**

LERU supports the EC's efforts to foster Responsible Research and Innovation (RRI), covering public engagement, science ethics, science education, gender equality, open access and governance. Ongoing and future H2020 projects to support the development and uptake of RRI are welcome with their results widely disseminated and carefully considered for future policymaking.

# CITIZEN SCIENCE AT UNIVERSITIES: TRENDS, GUIDELINES AND RECOMMENDATIONS

## LEAGUE OF EUROPEAN RESEARCH UNIVERSITIES

University of Amsterdam - Universitat de Barcelona - University of Cambridge - University of Edinburgh  
University of Freiburg - Université de Genève - Universität Heidelberg - University of Helsinki  
Universiteit Leiden - KU Leuven - Imperial College London - University College London - Lund University  
University of Milan - Ludwig-Maximilians-Universität München - University of Oxford  
Pierre & Marie Curie University - Université Paris-Sud - University of Strasbourg  
Utrecht University - University of Zurich

The League of European Research Universities (LERU) **recognises the potential of citizen science for research and its role in the open science movement.** LERU is aware that **modern IT technologies enable citizens to engage** in monitoring pollution, collecting data on biodiversity, language studies as well as many other research activities. LERU's commitment to tracking important trends in research, advising on them and encouraging a productive relationship between science and society motivates this paper.



## Urban bees - Universitat de Barcelona

This project uses urban bees as indicators of environmental quality of a city, through open source sensors installed outside and inside urban beehives. It involves environmental scientists, physicists, technologists and artists as well as citizens.

Taxonomy: environmental studies / volunteer sensing / problem solving

Platform: Open Systems, <http://www.ub.edu/opensystems/>

Partners: Natural Sciences Museum Barcelona, European Project "Socientize"

Website: <http://openbeerresearch.org>; <http://www.ub.edu/opensystems>

## Galaxy Zoo - University of Oxford

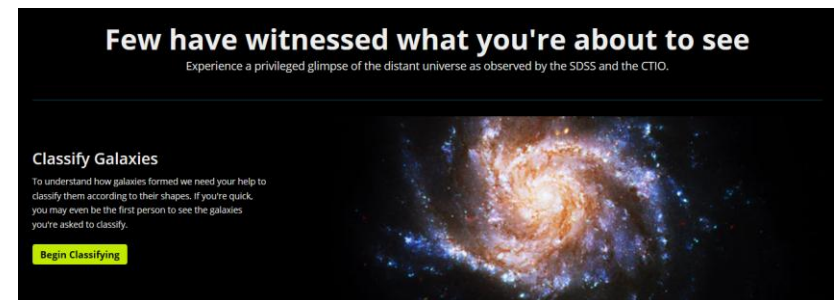
This project is about classifying images of galaxies collected from large-scale automatic surveys such as the Sloan Digital Sky Survey. The goal is to deduce from the visible appearance of many galaxies the mechanisms that govern the formation of galaxies.

Taxonomy: astrophysics / volunteer thinking / micro-tasking

Platform: Zooniverse

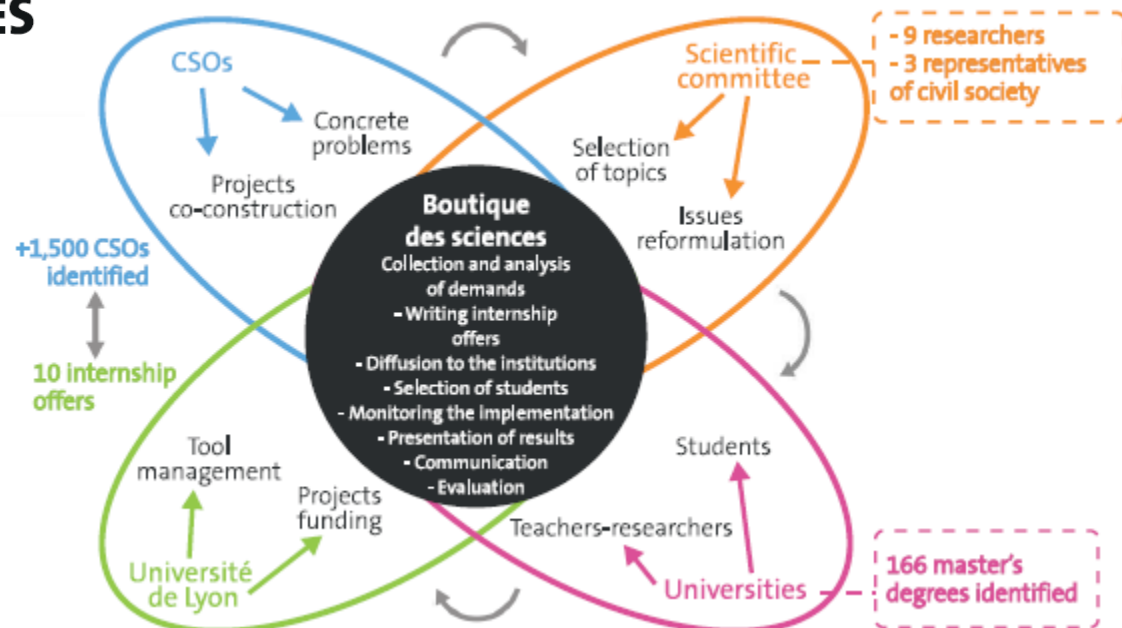
Partners: Many universities in Europe and the USA

Website: <https://www.galaxyzoo.org>





A Science Shop provides independent, participatory research support in response to concerns experienced by civil society.





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<http://www.dtransform.eu/>



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