



PROCEEDINGS OF
SCIENCE&YOU 2021
PARALLEL SESSIONS

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**ACTES DES SESSIONS
PARALLÈLES DE
SCIENCE&YOU 2021**

#SciYou2021



RRI management in Spanish universities: towards an effective dialogue between science and society

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MOTS CLEFS

RRI, universities, science communication, dialogue, science and society

RÉSUMÉ

Responsible Research and Innovation is a concept promoted by the European Union for more than a decade to establish a real dialogue between science and society, especially among those affected by the activity of the scientific community. The work traces the evolution of the concept and approaches its real application in the case of Spanish universities, institutions that account for more than 60% of the country's scientific production. In this sense, the research shows that the real application of RRI

is limited to four universities, three of which have participated in H2020 projects related to the subject. The text gathers the main experiences in this field and encourages Spanish universities to advance in the practical application of RRI to achieve a true participatory dialogue with society.

TEXTE

• Introduction

From the 2010s, RRI emerged in Europe and was driven by European institutions. In the beginning, the aim was to set some guidelines in the research used as regulatory frameworks to be considered in developing European R&I (Flipse et al., 2013; Owen & Pansera, 2019; Özdemir, 2019; Rip, 2014).

In 2012 European Union defined the RRI concept: "Responsible Research and Innovation means that societal actors work together during the whole research and innovation process in order to better align both the process and its outcomes, with the values, needs and expectations of European society. RRI is an ambitious challenge for the creation of a Research and Innovation policy driven by the needs of society and engaging all societal actors via inclusive participatory approaches" (European Commission, 2012b). The underlying idea is that research and innovation need to be democratized and must engage with the public to serve the public (Braun & Griessler, 2018a; René von Schomberg, 2013). RRI becomes a requirement of the EU in order for the scientific community and society to work together so that the processes and results of science respond not only to the expectations, values and reflection of researchers, but also to those of the citizenry (García-Marzá, Fernández Beltrán, & Sanahuja, 2017). Hence RRI can be claimed to be a concept that comes from EU scientific legislators and institutions in a top-down process (Burget et al., 2017; García-Marzá, Fernández Beltrán, & Sanahuja, 2017). However, at the same time, the RRI concept and its implied practice imply are also bottom-up process. A process in which already existing experiences should be taken into account, as well as encouraging mutual learning with this reality (E.-M. Forsberg et al., 2018).

The RRI definition that saw the light in preliminary stages was developed by von Schomberg, and is still the most quoted and used one:

"Responsible Research and Innovation is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view on 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)" (René von Schomberg, 2011)

Then the RRI concept arises in the Horizon 2020 Strategy context, promoted by the European Commission's Science in Society Programme in May 2011. Since then, the RRI concept has been based on three discourses: democratic governance, responsiveness and responsibility (Owen et al., 2012; Stilgoe, Owen, Macnaghten, et al., 2013).

El presents análisis pone se enmarca en los avances en el desarrollo de un sistema ético de gobernanza de la RRI desarrollado a través del proyecto ETHNA System, poniendo el foco en este caso en el ámbito de la comunicación desde el concepto de Public Engagement (PE). The ETHNA System project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 872360.

The Public Engagement in RRI

For the European Union the concept of Public Engagement (PE) in the context of RRI refers to the «engagement of all the societal actors-researchers, industry, policy-makers, and civil society and their joint participation in the research and innovation process» (European Commission, 2012a). The concept of PE predates RRI, and its momentum is linked to the evolution towards the science model for society and governance of science style public participation is linked to the loss of trust in science, technology, politics and government «top-down» which stimulated activism «bottom-up» (Landeweerd et al., 2015). In the academic field, the engagement with the actors researchers and of the public is considered essential for research and innovation; understanding PE as a key feature of RRI, so that «only if issues on the practical implementation of Public Engagement are resolved is it likely that the RRI concept can be taken up and be made sustainable» (Marschalek, 2017, p. 216). In the RRI context, participation with stakeholders implies listening to them in innovation processes; exploring their opinions and views both at substantive and a target levels to investigate and incorporate their points of view (Koops et al., 2016).

However, several voices agree that on many occasions PE vision is limited to disseminating information to the public without achieving real participation (B. C. Stahl, Akintoye, et al., 2019). This appears to be linked to the evolution in the ways of understanding

the communication of science, of the deficit model based on the unidirectionality towards the science-society dialogue model that leads to a two-way and dialogical relationship with the public (Alcibar, 2015; Brossard & Lewenstein, 2009; Horst & Michael, 2011; Miller, 2001). The concept of PE is also related to the dimension of inclusion (Stilgoe, Owen, & Macnaghten, 2013) involving all stakeholders at an early stage and allowing innovation to develop in a joint construction way with a collective approach of responsibility (Owen, Stilgoe, et al., 2013; René von Schomberg, 2007).

There is a large number of mechanisms for the institutionalization and development of public participation and a confusing multitude of terms to name them. Before the emergence of the concept of RRI, Rowe & Frewer (2005) already raised the interest of classifying them, establishing three categories which are differentiated according to the nature and flow of information between exercise sponsors and participants: public communication, public consultation and public participation. For each category they identify and classify the most common methodologies and analyse different variables for their effectiveness (selection method of participants; facilitation of information elicitation, response mode, information input and medium of information transfer). The classification includes a variety of mechanisms of PE, extended in the review by Ribeiro et al. (2017) included in the introduction section.

Regarding the identified good practices of this key issue in the EU political agenda for the development of RRI, we can find the most complete and updated review in Schuijff & Dijkstra (2019). In what they classify as «Opening up research and innovation» practices, three subtopics are included: The first one, related to stories, describes five practices linked to one-way communication. The second one, involving experts and stakeholders, includes 16 practices that integrate meetings or procedures that were intended to actively involve experts or stakeholders using different formats such as awareness-raising scenario workshops (Gemen et al., 2015) co-evolutionary scenarios (Robinson, 2009) and dimensions for good commitment (Malsch, 2015). They also include interesting tools such as multi-stakeholder advice proposed by the Ravesteijn et al. (2014) and the mobilization and mutual learning Action Plan of Gemen et al. (2015). The third one, societal dialogue, includes two cases: Krabbenborg & Mulder (2015) who studied a societal dialogue on nanotechnology in the Netherlands, advocated seeing a societal dialogue as a process; and Simaková & Coenen (2013), who analysed two narratives about nanotechnology in Germany and concluded that societal dialogues should include an alternative to the risk-benefit discourse and dominant narratives.

Based on the ethics of the speech, an interconnected network of discourse ethics is proposed to the Human Brain Project (HBP) (B. C. Stahl, Akintoye, et al., 2019) as a suitable model for integrating RRI in large projects involving various disciplines, institutions and countries. Also based on dialogical ethics, Fernández Beltrán et al. (2017) propose a dialogical communication model that was implemented experimentally in a research project on Alzheimer's disease and other on innovation in science parks, achieving in both cases changes in processes (Sanahuja Sanahuja et al., 2019). Another practical example can be found in the approach to citizen and expert participation analyzed by Repo & Matschoss (2019) following the methodology first developed in the European Civisti project in which citizens describe their visions of the future in a way of setting objectives, while experts translate these visions into research priorities and policy recommendations to achieve those objectives. Other interesting practical proposals are responsibility networks raised by Timmermans et al. (2017); the non-reductive and ethical approach to stakeholder participation by Blok (2019), for which establishes a series of recommendations to be followed in the selection stages, design and institutionalization of the partnership; or the experiment in anticipating futures through a methodology of public deliberation based on scenarios by Lehoux (2019), which demonstrates how participants can anticipate complex socio-technical futures in a creative and empathetic way. As we have seen, PE has a long history and includes many types of practices and countless methods for their application that move on a scale of more or less interaction and can range from more unidirectional communication actions to processes of continuous dialogue and participation. While no one questions the interest of PE for the development of a responsible R&I (the form to select stakeholders) the quality of participation and management of

contributions seem to be some of the main challenges to be faced.

The role of research in the Spanish University

The research was not incorporated as one of the main functions of the University in Spain until the arrival of democracy and, above all, with the approval of the University Reform Law (LRU) in 1983. In contrast to other European countries, where the Humboldtian model of the university, based on the close relationship between teaching and research, had spread throughout the 19th century (Sanz, 2003: 186), the Spanish university tradition was based almost exclusively on its teaching activity until almost 40 years ago, when funding and legal regulations made research activity one of the two basic functions of the university, together with higher education.

This different historical evolution has not prevented the Spanish university from occupying a preferential place in the Spanish Science, Technology and Innovation System, which, as defined in the Law on Science, Technology, and Innovation (14/2011), is made up of a set of public and private agents, including universities. The universities constitute, together with the Public Research Organizations (OPI), the basic core of the Spanish public system of scientific research and technological development, since they carry out most of the activities programmed in the National Plan for Scientific Research, Development, and Technological Innovation. According to data from the Ministry of Science and Innovation, the University represents 62% of the national scientific production, with a level of funding that represents 27.6% of total public expenditure. University researchers meet in university departments to carry out their teaching activities, but to carry out their research activities they are integrated into research groups or other structures, such as University Institutes, Joint University-CSIC Institutes, Autonomous Community research institutes, etc.

All these are structures that seek to strengthen the research of university groups around problems of greater projection and strategic importance and thus achieve greater efficiency.

According to the IUNE 2020 Observatory Report on university R&D+I, which collects the latest available consolidated data, scientific publications in Spanish universities exceeded half a million documents in 2018, representing a growth of 7% per year, while their staff remained practically the same, which implies a growth in scientific productivity, as the number of publications per professor per year increased from 0.61 to 0.95 documents. Concerning patents in Spanish universities, and according to data collected by the IUNE 2020 Observatory, a total of 5, 141 granted by the Spanish Patent and Trademark Office (OEPM) have been identified in the ten years between 2009 and 2018, representing a growth of 37.61%.

The rise of university communication

In the field of universities, communication is playing an increasingly fundamental and strategic role (Fernández-Beltrán, 2007), which has led to it being an activity that has been in constant growth for more than two decades. In parallel to the growing importance of corporate communication (López Lita, 2006), university communication has been developing and professionalizing during the 21st century, as shown by different studies (Losada-Vázquez, 1998; Losada-Díaz, 2002; Durán-Mañes, 2005; Castillo-Díaz, 2007; Fernández-Beltrán, 2007; Blanco-Sánchez, 2014). These investigations have addressed very different aspects of the communicative activity of universities, which has evolved from a lack of concreteness and strategy (Losada-Díaz, 2002 and 2004) to the implementation of new relationship models based on networked communication (Simancas-González, 2016).

Likewise, since the 2010s we have been witnessing a growing development of scientific communication as one of the main ways of working in universities, in parallel to the promotion of the so-called Scientific Culture and Innovation Units (UCC+i) promoted in higher education centers by the Spanish Foundation for Science and Technology (FECYT), which have become one of the main agents in the dissemination of science in our country (García Marzá, 2017). The UCC+i have been key to the professionalization and development of the sector and are currently responsible for the communication and dissemination of science in a large number of Spanish universities and research centers (Fernández-Beltrán, 2020). In their work to support science communication, the UCC+i are at the service of researchers to

advise them on how to communicate their projects and results, and in this sense, they can play an important role in facilitating the necessary dialogue between society and researchers that, as we have seen, RRI requires.

2. OBJECTIVES

The general objective of this research is to analyze the level of implementation of Responsible Research and Innovation in Spanish universities, as well as to determine which are the best communication practices carried out on campuses to facilitate the dialogue between science and society.

Our initial interest has focused on finding out whether Spanish universities have incorporated elements related to RRI in their communication management and to what extent these are or are not an activity of their Communication departments and/or the aforementioned UCC+i.

3. METHODOLOGY

The object of study of this research is the 83 Spanish universities, among the 50 public and 33 private, which currently make up the Spanish University System. To approach this plural and complex reality, we have carried out triple access to information. On the one hand, we sent a questionnaire to all members of AUGAC, the Association of Communication Office Professionals of Spanish Universities, public and private, and Research Centers, which brings together professionals who work in services or areas of institutional communication and press offices of Spanish universities and research centers.

AUGAC was founded in 1985 and is currently governed by a Statute protected by the Organic Law 1/2002, of March 22nd, and has legal capacity and full capacity to act, without profit motive. Its purpose is to Project University, cultural and scientific-technological issues to society through the use of all existing disciplines and communication channels. One of its most important objectives is to ensure that the professional practice of its members is carried out in conditions of independence and objectivity, since its mission is to transmit, with transparency, the university activities to the surrounding society, as stated in the preamble of the LOU. To achieve its goals, the Association carries out activities of continuous training, organization of study days, joint analysis of problems related to the professional practice of its members, establishment of relations with entities of other countries or international entities of similar characteristics, which represent the university interests at different levels.

In this case, an email was sent to all AUGAC members on July 7, 2021, with the following questionnaire:

We contact you because colleagues from the Universitat Jaume I are preparing a work on communication and RRI (Responsible Research and Innovation) and request help from universities that are working on these issues. Specifically, they pose three brief questions:

1. Does your university work on RRI issues?
2. If so, is there a website where this information is collected?
3. Does the communication service participate in the management of RRI? If so, how is this participation materialized?

Secondly, we sent the same questionnaire sent to AUGAC to the Communication distribution list created by RedIris, which is a forum for information and debate aimed at university professors and researchers in social communication. Among others, the RedIris Communication forum aims to facilitate the exchange of knowledge in the Spanish academic community using email and web and providing support of a specialized service of distribution lists allowing the exchange of quality content. It also seeks to encourage discussion in Spanish on topics that are usually done in English and to debate and coordinate, through e-mail, in a fast, elegant, and effective way, groups of interest in the RedIRIS Community and the international Spanish-speaking environment. In this case, the questionnaire was distributed via the e-mail list on July 8, 2021.

Finally, we have complemented this quantitative analysis with a study of content related to RRI on the websites of Spanish univer-

sities, which has allowed us to know what the different aspects that are advertised on this subject from the Spanish campuses are.

4. RESULTS

Through the questionnaire distributed by AUGAC, we obtained two responses, corresponding to the National University of Distance Education (UNED) and the University of Deusto, in which they explained their practice in this area. However, only in the case of Deusto can we consider the information provided to be valid, since in the case of the UNED their response referred at all times to the incorporation of the Sustainable Development Goals (SDGs) into the University's Strategic Plan, but made no mention of any specific project related to RRI.

In the case of Deusto, the university's Communication Service states that it has been working for years on key actions to promote and disseminate the social impact of its research, as well as on the application of ethical criteria to all research that requires it. According to the university, this information is contained on the Deusto Research website, which has a section on social impact, and on the Research Ethics Committee website. According to the university itself, the social impact website includes several communication initiatives and a storytelling section, created by the International Research Projects Office (IRPO). In addition, for years the UD-Banco Santander Chair Award has been associated with social impact, and the communication area publicizes the awards of this prize. However, a subsequent analysis of these contents shows that this website shows the value and social impact of research at the University of Deusto, but there is no practice related to RRI since it does not provide any mechanism for participation or dialogue with society or specifically with the groups involved or related to their research. Therefore, none of the responses obtained in this way were valid.

Concerning the questionnaire distributed by RedIris, the number of responses was greater, since we obtained five answers, but three of them were to indicate that their university did not carry out any action in this field and the other two informed us of the activity of the same center, the Universitat Pompeu Fabra.

A greater number of results were obtained by browsing the websites of the 83 Spanish universities, which we visited during June and July 2021 to find out what information they had on RRI. In this case, we found three types of realities. On the one hand, the vast majority of university websites lack information on this practice, although it is a clear commitment of the European Union and its research policy, with which Spanish campuses should be aligned. Secondly, we have found a small number of universities that do provide information on RRI, but generically, referring to EU pages or succinctly explaining the concept, as is the case of the Universidad Carlos III de Madrid, the Universidad Complutense de Madrid, the Universidad de Valladolid, the Universidad de Castilla-La Mancha, and the Universitat de Girona, to cite just a few examples. We do not include a complete list of these universities because we consider that it is not relevant for this paper, which is more focused on highlighting the good communication practices specific to each university. Finally, web browsing has allowed us to discover a list of Spanish universities that have begun to carry out their projects in the field of RRI, such as the University of Barcelona, the Autonomous University of Barcelona, the University of Murcia, and the Universitat Jaume I, whose reality is also directly known to us because we participate or have participated in some of their activities in this field.

From the three sources of information cited above, we can determine that the Spanish universities that are currently working in the field of RRI are the following with these initiatives:

Pompeu Fabra University

UPF is one of the first universities to start working professionally with the concept of RRI, as shown in last year's report <https://www.upf.edu/web/responsabilitat-social/recerca-i-innovacio-responsable-rr-i>. In this respect, in addition to training sessions held

by the Research Service, the website has extensive content on the subject, as well as specific initiatives, such as the «Financial aid for activities of the social impact of research» (<https://www.upf.edu/recercaupf/convocatoria-ajuts-impacte-social-recerca>)

In addition, UPF supported an H2020 project led by the researcher Gema Revuelta, who directs the Center for Science Communication Studies at the University for the Development of training tools in RRI in higher education, of which some modules are being implemented at UPF. <https://heirri.eu/>

In addition, the UPF Institutional Commission for the Ethical Review of Projects (CIREP-UPF) offers online courses on personal data protection and compliance with ethical requirements in research projects. The training is currently offered to doctoral researchers and a pilot test is being carried out to define the exact scope to make it available, perhaps as a mandatory element, to the entire research community.

Another unique initiative of this university is Science in Action, which allows researchers in the Ph.D. program in Biomedicine at UPF to become familiar with the concepts that currently govern good scientific practice. The course contents are based on the PRBB Code of Good Scientific Practice, initially published in 2000, and the methodology includes group discussions, role-playing, and other interactive activities.

The Communications area has done important work to publicize this important UPF activity, as shown in the first issue of the magazine 360, which explains the RRI at UPF <https://www.upf.edu/web/360upf/numero1>

Universidad de Murcia

UMU is engaged in Responsible Research and Innovation (RRI), involving social actors (researchers, citizens, legislators, companies, third sector entities, etc.) working together throughout the research and innovation process to better align the process and results with the values, needs, and expectations of society. In practice, UMU works on each of the thematic elements comprising the RRI:

- Open Science
- Gender equality in research and innovation
- Ethics
- Public engagement in RRI
- Science Education

Also, this university has organized various activities and training sessions for researchers.

Jaume I University

In the case of the Universitat Jaume I, the actions related to RRI are the following:

- **Inclusion of RRI in the University Social Responsibility Plan of the UJI (RSUJI).** The RRI is integrated as a key element in the RSUJI Plan, as a standard of conduct derived from the value of innovation contained in the university's Code of Ethics, which establishes, among other aspects, the need to encourage «the responsible use of knowledge generation and technology, promoting a permanent dialogue between science and society, to align the processes and results of research and innovation with social values and needs, always promoting open access to knowledge and research data generated». The University Social Responsibility Report also includes a section on the results of RRI management.

- **Conference on University Social Responsibility and Responsible Research and Innovation.** The UJI has organized several annual conferences on university social responsibility and responsible research and innovation, which have become a point of reflection and debate on the state and evolution of the RRI. The proceedings of the conferences are collected in the books published in open access in the «Humanities» collection of Publicacions de l'UJI. Videos and presentations can also be accessed from the conference website.

- **Training on RRI.** The Doctoral School of the UJI offers the course «Responsible Research and Innovation (RRI): Ph.D. projects» to introduce future researchers to RRI and facilitate reflection and discussion on how responsibility can be understood and practiced in academic research. A course is an approach to different concepts and approaches to RRI and its application to concrete examples of research and innovation.

Along with this, the UJI has carried out several studies and projects

- **Experiences in responsible innovation: an opportunity for Valencian science parks.** The project, subsidized by the Regional Ministry of Education, Research, Culture, and Sport, aims to transfer to the Network of Valencian Science Parks (REPCV), made up of science and technology parks of Valencian public universities, the opportunities to apply Responsible Research and Innovation (RRI) in the innovation processes of companies based on the experience of the Science, Technology and Business Park of the Universitat Jaume I (Espaitec).

- **Communication for the development of responsible research and innovation: an applied experience in biotechnology against Alzheimer's disease.** The project has aimed to promote dialogue and participation actions around research related to the field of Alzheimer's and neurodegenerative diseases that are developed at the Universitat Jaume I and has been funded by the Spanish Foundation for Science and Technology and developed by the Scientific Culture and Innovation Unit, in collaboration with the Group of Practical Ethics and Democracy, with the support of the Vice-Rectorate for Research and Transfer.

- **Towards responsible innovation: science parks as an engine of change.** The project, funded by the Regional Ministry of Education, Research, Culture, and Sport, aims to promote responsible research and innovation in the Science, Technology and Business Park of the Universitat Jaume I (Espaitec) to, from here, extend it to the rest of the Valencian innovation ecosystem. Thus, an action plan has been designed to promote the incorporation of RRI in the innovation processes of Espaitec companies and thus increase their competitiveness and internationalization.

- **Study on the dialogue between science and society in Spain: proposals to move towards RRI from communication (2017).** The project carried out with funding from the Spanish Foundation for Science and Technology (FECYT) of the Ministry of Economy and Competitiveness contributes to a better understanding of the state of scientific culture in Spain from the perspective of RRI from the analysis of the actions promoted by universities and research centers to promote science-society dialogue. Based on the analysis, proposals for good practices to encourage it are proposed.

- **Study on the communication of responsible research and innovation in the UCC+i: a proposed model (2016).** The project, funded by the FECYT, analyzes the science communication actions developed by the UCC+i from the perspective of strengths and weaknesses regarding RRI communication and develops a proposal for a model of ethical communication of RRI for the UCC+i that allows meeting the challenges and demands established by the European Union to move towards more responsible research and innovation.

It should also be noted that the UJI leads an H2020 project focused precisely on the implementation of an ethical governance system for research institutions that aims to formalize the exercise of RRI. The goal of the project "Ethics Governance System for RRI in Higher Education, Funding and Research Centers", in short, ETHNA System (<https://ethnasystem.eu/>), is to implement and enforce internal management and procedural system of the Responsible Research and Innovation (RRI) within 6 European Higher Education, Funding and Research Centers (HEFRC). It aims to generate a process of Ethical Governance of the Responsible Research and Innovation where Gender equality, Open Science, Public Engagement, and Integrity Research (ethics) dimensions will be also necessarily addressed through multi-stakeholder governance. It will be translated into a new formal organizational structure that will facilitate compliance with all RRI dimensions in all scientific disciplines as well as assuring the innovations accomplished are made according to the needs of civil society demands.

Autonomous University of Barcelona

The UAB is currently participating in several European projects to promote RRI at the institutional level:

SeeRRI: (Building Self-Sustaining Research and Innovation Eco-

systems in Europe through RRI). The project aims to move towards a model of more sustainable ecosystems, which includes all actors in the territory (research and education, business, administration, and citizens, which is called the quadruple helix) and incorporate the principles of RRI.

The project is led by the Nordland Research Institute of Norway and involves, in addition to universities and research centers, regional governments, and business associations. Three European territories with different smart specialization strategies have been selected as case studies.

HEIRRI: The Universitat Autònoma de Barcelona has been one of the institutions selected to participate in a pilot test for the application of two of the training programs and materials developed within the framework of the HEIRRI project, which, as we have seen, is promoted by the UPF and oriented to RRI training in higher education institutions. The proposal presented by the UAB was considered one of the best, which led it to receive the mention of collaborating institutions in the process of implementation and feedback of training materials on RRI. UAB actively participated in the learning process, giving feedback on the materials and their formative use. In April 2018 UAB participated in the Second HEIRRI Conference, sharing its experience with other higher education institutions.

UAB also piloted the training and materials linked to two of the five courses designed under the HEIRRI project.

- Doctors in charge: Program on RRI and Ph.D. Research Projects, aimed at early-stage researchers in training (doctoral students).
- Facilitating reflection on RRI. The program is aimed at academic and non-academic university staff.

EGERA (Effective Gender Equality in Research and Academia). The EGERA research project brings together eight research centers and higher education institutions in seven EU member states (Belgium, Czech Republic, France, Germany, the Netherlands, Portugal, and Spain) and Turkey, united by a common commitment to achieve gender equality in this field.

PERFORM aims to investigate the effects of using innovative arts-based science education methods to promote the motivation and engagement of young people in science, technology, engineering, and mathematics (STEM) in selected schools in France, Spain, and the UK.

ORION (Open Responsible research and Innovation to further outstanding knowledge). This project focuses on embedding RRI principles (ethics, gender, governance, social commitment, and science education) in research and funding organizations (RPFOS) by fostering institutional and cultural changes.

University of Barcelona

For its part, the University of Barcelona has an Observatory of Bioethics and Law and Responsible Research and Innovation. The research, teaching, and knowledge transfer and dissemination of the research center Observatory on Bioethics and Law (OBD) of the University of Barcelona, integrates since its inception the six policy agendas that make up the RRI. Without making explicit use of the novel term «RRI», the OBD has built bridges between the academic and scientific community and society, empowered multiple actors, and fostered interdisciplinary research in bioethics and human rights.

In particular, OBD has led several research projects on bioethics capacity building and gender equality in health and research. To foster a more democratic and transparent society, the OBD has promoted since its creation through concrete actions the autonomy, responsibility, and citizen participation in decision-making in typically bioethical areas such as health care and research but also concerning the applications of scientific-technological advances such as nanoscience and nanotechnology, assisted human reproduction and genetic applications. Also, the work of

the OBD Opinion Group, through the publication of documents, reports, and statements available online, exemplifies open access to information and knowledge sharing between the university and society as a whole.

The following are examples of OBD activity in the 6 areas of RRI.

Science Education.

The OBD understands scientific education linked to the analysis of ethical, legal, and social aspects as a tool that promotes free and informed decision-making.

- **Young people, science and ethics»** program (with the support of the Fundació Catalana per la Recerca). The program aims to stimulate the critical thinking of high school students and promote their involvement in the ethical debates raised by current scientific issues, as well as to encourage scientific vocations.

- **Network for the Joint Teaching of Bioethics (ALFA EU Program):** Project to develop a common program for the inclusion of the subject of Bioethics in the curricula of the participating European and Latin American universities on a cross-cutting basis. This program received the mention of good practices from the European Commission.

- **Master's Degree in Bioethics and Law of the University of Barcelona:** The Master in Bioethics and Law, coordinated by the OBD, provides a global and integrative vision of bioethics and its legal and social implications. It is a postgraduate program, with more than 20 years of experience, which provides interdisciplinary training and prepares students of different profiles for decision making due to the impact of scientific and technological advances and the issues raised by biomedicine and technology.

- **Master's Degree in Food, Ethics, and Law of the University of Barcelona:** The Master, coordinated by the OBD, aims to train students to critically reflect on the ethical and legal aspects related to food and gastronomic research, as well as on the functioning of the food chain itself.

Gender Equality

The OBD promotes women's equality in scientific, academic, and professional activities.

- **Women and Science Paper.** Statement of the OBD Opinion Group that analyzes the inequality of women in the academic and scientific context and provides recommendations to break the «glass ceiling».

Open Access

To enhance access to information, knowledge sharing, and transparency, it is possible to access the OBD documents through the online bookstore free of charge.

- **Bioethics and Law Journal.** An electronic journal in open access, created in 2004, as a channel to provide scientific, rigorous, and contrasted information as well as rational and reasonable humanistic arguments that contribute to define and select bioethical problems and open the social debate to citizen participation. The Journal is indexed in the main repositories of recognized quality and impact.

- **Open Access Publications.** From the OBD's web page it is possible to consult publications since 1981. In particular, the editorial collection «Bioethics and Law».

Governance

The OBD makes recommendations to promote free and informed decision-making and accountability to contribute to a more transparent and democratic society.

- **Documents** of the OBD Opinion Group. The OBD responds to techno-scientific issues that are the subject of public debate by producing reports, documents, and statements that set out the contrasting opinions of the group and invited specialists. The state of the question and the proposals are published in open

access to be disseminated and have a direct impact on the media and on the elaboration of policies and regulations as well as on the scientific societies involved.

Ethics

The OBD contributes to a global, plural, and multidisciplinary debate on the principles and fields of study of bioethics. It also promotes research, training, and dissemination through a system of integrated activities.

- **Bioethics Commission of the University of Barcelona.** The Bioethics Commission of the University of Barcelona (CBUB) evaluates research projects for which members (academics and researchers) of this University are responsible. The favorable opinion of the ethics committee of the center where the project is to be carried out is a legally established requirement to initiate any research on human beings, with biological samples of human origin and personal data.

Citizen participation

The OBD promotes an informed social debate as well as citizen involvement in the decision-making process in the field of bioethics.

- **Freedom to decide.** OBD's online initiative is compatible for use on mobile devices, to facilitate autonomous decision-making by citizens on issues related to bioethics.

5. Discussion and conclusions

The first evidence shown by this research is that the practice of RRI, at least at the institutional level, is a minority in Spanish universities. Few universities have developed actions to promote

dialogue and participation with the audiences affected by their research. Although it is true that the concept has been promoted by the European Union and that many universities collect generic information on it, its practical application is still very limited, with only four examples worthy of mention.

Likewise, the level of responses obtained from university communication professionals is very significant, since only two responses were obtained, and in both cases they were not related to the actual concept of RRI. This situation is worrying, since as we have exposed (Fernández Beltrán et al. 2017), the role of communication is critical to achieve an adequate management of RRI.

Another interesting conclusion of this analysis is that the universities that present a higher level of maturity in the field of RRI are those in which a H2020 project related to the subject has been developed or is being developed, which evidences the close relationship between research and practical application in such novel and cutting-edge aspects as the one that concerns us. From the temporal sequence of the projects, it seems that in the case of the universities of Barcelona and Autònoma de Barcelona the HEIRRI project led by the Universitat Pompeu Fabra has acted as a driver for the implementation of good practices on these campuses, while in the case of the UJI the ETHNA System project reflects an intense work developed previously through national and regional projects, and faces the challenge of deploying a management system that consolidates the practice of RRI as a regular process. It would be desirable for this last objective to be gradually extended to the rest of the Spanish campuses, which should systematize processes to achieve greater dialogue and participation between their scientific community and society.

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