Stock taking/ Inventorying (WP2)

D2.3 HEIRRI Database

HEIRRI

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PROJECT DETAILS		
	Project acronym HEIRRI	**Project title** Higher Education Institutions and Responsible Research and Innovation
	Funding scheme Horizon2020	**Thematic priority** Responsible Research and Innovation in Higher Education Curricula
	Starting date 01/09/2015	**Project coordinator** Universitat Pompeu Fabra (UPF)
	Duration of project 3 years	

DELIVERABLE DETAILS		
	Work package ID WP2	**Expected date** 31/08/2016
	Work package title Stock taking / inventorying	**Deliverable ID and title** Deliverable 2.3: HEIRRI Database
	Work package leader Niels Mejlgaard	**Deliverable description** The main objective is to develop a database containing the evidence collected during Task 2.1, the State of the Art review, and to provide open access to its contents.
	Nature [X] R – Report [　] O – Other	**Responsible for deliverable** Niels Mejlgaard
	Submission date 31/08/2016	**Dissemination level** [X] P – Public [　] CO – Confidential, only for members of the consortium

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HEIRRI Database

Niels Mejlgaard, Ivan Buljan, Núria Saladié, Marlene Altenhofer, Marta Cayetano, Nadja Gmelch, Erich Griessler, Sigurd Gylstroff, Alexander Lang, Ana Marušić, Gema Revuelta, Roger Strand, Milena Wuketich

with the HEIRRI consortium

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0. About HEIRRI

RRI (Responsible Research and Innovation) is a transformative emerging principle of research and innovation policy. The RRI concept emerges from scholarly research that is critical of the status quo and of the science-society interface. The aim of the HEIRRI project (Higher Education Institutions and Responsible Research and Innovation) is to start to integrate RRI within the formal and informal education of future scientists, engineers and other professionals involved in research and innovation process.

HEIRRI takes as its starting point the six RRI key aspects identified by the European Commission: public engagement, gender equality, open access, science education, ethics and governance in R&I. Most crucially, HEIRRI wants to stress the potential of RRI as a transformative, critical and radical concept.

HEIRRI will create a stock-taking inventory including a State of the Art Review and a Database, to be shared through open access. The inventory will gather results of other EU-funded RRI projects and good practices in RRI and RRI learning. Also, various stakeholders involved in or affected by R&I will participate in a debate and reflection process on RRI Learning through online and offline Forum activities.

Results from the inventory will represent the basis for RRI training programs and formative materials, offering the students knowledge and skills to develop viable solutions to specific problems related to R&I, integrating theory and practice. They will be designed for the different HEI educational levels (undergraduate, MD and PhD, summer courses and MOOC), mainly based on Problem Based Learning methodology, and supported by multimedia materials (videos and microvideos, 2.0 materials, etc). All results and products elaborated by HEIRRI will be uploaded on OA at RRI Tools Platform.

An internationalization plan will guarantee their spreading awareness and future use by HEI from Europe and beyond. A global scope and expertise on RRI will be provided by HEIRRI consortium that consist of 5 european HEI (Universitat Pompeu Fabra, UPF; Universitetet I Bergen, UiB; Aarhus Universitet, AU; Institut Fuer Hoehere Studien und Wissenschaftliche Forschung, IHS; and Sveuciliste u Splitu, UNIST), the European network of science centres and museums (AEESTI/Ecsite), "la Caixa" Foundation (FBLC), a network of universities (Associació Catalana d'Universitats Públiques, ACUP) and a private company specialized in R&I (Innovatec).

1. Introduction

The objective of the deliverable at hand 'Deliverable 2.3: HEIRRI database' is to summarize the main results from the State of the Art Review (Task 2.1) and present the contents of the HEIRRI database, which has been constructed on the background of the review. The main overall objectives of WP2 are to 1) create an inventory of new and existing practices of RRI and RRI learning and 2) share it through the 'RRI Tools' platform. The activities included in WP2 have been thoroughly outlined in 'Deliverable D2.1 – Inventory Guide of Work'[1], and large blocks of text from D2.1 as well as 'Deliverable D2.2 – State of the Art Review[2]' have been recycled in the present report in order to enhance transparency and consistency.

The objective of Task 2.2 – 'HEIRRI database' is to develop a database containing the evidence obtained in the state of the art review and provide open access to its content. The development of the database has involved sorting and organizing the compilation of materials related to RRI teaching produced by the state of the art review, selection of 23 exemplary cases for the HEIRRI database, and development of case descriptions by partners in the HEIRRI project. The HEIRRI database will be integrated with the existing RRI Tools platform to facilitate open access.

This report will start out by presenting a synthesis of the main results from Task 2.1, the review of RRI learning, as a background to the selection of cases for the HEIRRI database. The bulk of the report, however, is concerned with the HEIRRI database. The report outlines the objectives of Task 2.2 and the methodology behind the construction of the database. Following that, a condensed overview of the cases compiled for the HEIRRI database is presented, and finally, the individual cases (entries to the database) are presented. The report includes the following chapters:

- A presentation of the results from Task 2.1 - State of the art Review of RRI teaching and learning in higher education institutions (chapter 2)
- A description of the purpose of the database and the methodological approach (Chapter 3)
- A comprised presentation of the HEIRRI database (Chapter 4)
- A complete presentation of the entries in the HEIRRI database (Chapter 5)

The template that was used for the individual case descriptions is appended (Appendix A).

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[1] https://issuu.com/heirriproject/docs/heirri_wp2_d2.1
[2] https://issuu.com/heirriproject/docs/heirri_wp2_d2.2

2. State of the Art Review

The main objective of Task 2.1 was to carry out a state of the art review of RRI and RRI learning in higher education institutions. The review was designed to correspond with the overall objectives of the HEIRRI project – understanding the processes and practices by which issues of responsibility in research and innovation are brought into teaching and learning contexts in higher education institutions. Because RRI is not easily and unidimensionally conceptualised[3], the review focused not only on literature and evidence specifically addressing 'RRI', but also broader literatures related to issues of responsibility more broadly. The review was designed to explore the different ways in which issues of responsibility in R&I can be taught and trained in higher educational institutions.

In relation to this aspect, it is important to note that while the HEIRRI project is guided by the notion of the 'six keys' of RRI, the review was sensitive towards elements of RRI in teaching even though they did not fit this scheme. Previous EC-funded projects such as the 'Responsible Research and Innovation in a Distributed Anticipatory Governance Frame - A Constructive Socio-normative Approach' (Res-AGorA) found that RRI is unevenly applied across European countries and that the facto rri may not universally fit the 'six keys'. In addition to this, the review was designed to support the subsequent work packages – the training programme design in WP3 and the development of training materials in WP4. Therefore the review aimed to capture a great variety of materials relevant to this purpose. The review encompassed academic literature and grey literature such as policy documents, project reports, training programmes and training materials, course descriptions, curricula, exemplary case descriptions etc. The review thus included a variety of different documents in order to arrive at useful understanding of ways of teaching issues of responsibility in higher education institutions.

2.1 Review methodology

The State of the Art review of RRI teaching involved a number of components, which were tailored to capture information regarding RRI in a teaching and learning context as specified in the previous section. The review consisted of six different components, as illustrated in Figure 1 below.

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[3] See HEIRRI deliverable D2.2 "*State of the art review*" for a further elaboration on this issue.
https://issuu.com/heirriproject/docs/heirri_wp2_d2.2

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Figure 1: Components of the review methodology
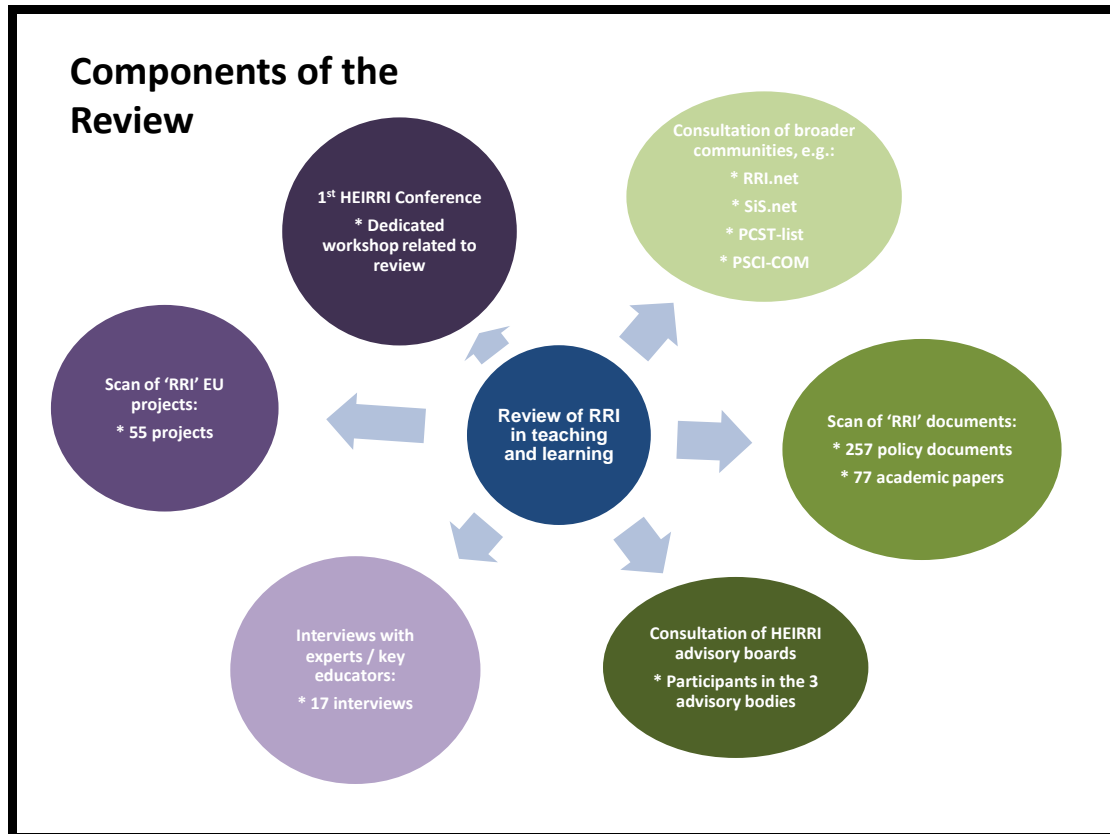
First, the review scanned selected 'RRI literature' that encompassed the body of academic papers and policy documents that directly addressed the notion of RRI and also a broader body of literature that focused on ideas and understandings of responsibility in research. To ensure that the review was in alignment with the overall structure of the HEIRRI project, the selected documents were sampled to cover at least the six dimensions of RRI, i.e. public engagement, science literacy and science education, gender equality, open access, ethics, and governance of research and innovation. A total of 334 documents were identified and reviewed.

Second, the review scanned selected EU-funded RRI-projects such as GREAT, Res-AGorA, and MoRRI. These projects were scanned for their relevance to the HEIRRI objectives and the review focused on perspectives particularly relevant in relation to the teaching and learning context of HEIRRI. These projects were identified by consulting the MoRRI project that recently identified relevant RRI projects. A total of 55 European projects were reviewed for this component.

Third, the review consisted of a set of consultative procedures aimed a harvesting 'RRI teaching' resources. This was achieved by conducting interviews with external experts such as key educators and

scholars in educational research that possessed extensive experience in introducing responsibility into teachings at higher education institutions. These experts were identified via an internal procedure, where members of the consortium nominated informants. The rationale for carrying out the expert interviews was to capture essential empirical documentation such as examples of course materials relating to responsibility in research to be utilized for the HEIRRI training programme design in WP3. In addition, the experts possessed unique information regarding both opportunities and barriers in relation to implementing RRI teaching in higher education institutions.

Furthermore, the members of the HEIRRI advisory boards and forums were consulted in order to identify additional resources for the review in the form of exemplary practices, programmes etc. Also, broader communities of scholars and practitioners were also consulted by means of email inquiries posted at relevant list-servers.

Finally, another important component of the review was the 1st HEIRRI conference celebrated in Barcelona on March 18th, 2016. At this conference a special workshop was arranged that aimed at summarizing the main messages from the conference and also identifying and collecting examples of courses and materials related to RRI.

By utilizing the above mentioned sources for the review it was possible to carry out an extensive and thorough review of RRI and RRI teaching. In the following, we will summarize the main messages emerging from the review.

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2.2   Main messages from review

Based on the review, some core elements of RRI teaching can be highlighted as desirable learning outcomes. Emphasis should be on developing the student's critical skills in relation to science. RRI teaching must enhance the student's ability for continuously critically questioning what constitutes good and responsible research and innovation within their scientific domain. By fostering critical thinking, students will be able to keep science responsible and also ensure that research is not ignorant towards societal values and preferences. Teaching should invoke questions such as: 'what constitutes good and useful knowledge within my field of specialisation?', 'what are the effects of the research and innovation activities within my field on broader society?', and 'what mechanisms can be used to align knowledge production within my field with societal needs and expectations?'.

Moreover, RRI teaching should foster reflection about the interrelatedness of the students' own academic domain and other areas of science. RRI teaching should enhance the students understanding of how their scientific domain and the skills they acquire in their education is related to other scientific domains. For instance when a young researcher is conducting research within the domain of bioengineering she should develop an understanding of the intersections of her own field and other scientific domains and should be able to recognize her own place in the broader knowledge- and societal ecosystems. RRI teaching should help students realize that the epistemological and social problems of research and innovation are not independent but interrelated.

Critical, reflexive capacity is crucial for understanding the role and responsibilities of ones' own field of research. Acquiring 'interdisciplinary' skills, the ability to collaborate and coproduce knowledge with researchers and professions outside your own field, is therefore also important. RRI teaching should address this capacity for interdisciplinary collaboration, and the notion of hybridization emerged as a relevant concept in the review. Hybridization captures the process of combining insights from across disciplines as well as combining sound knowledge of norms and good practices in science with sound analyses of the cultural, economic, environmental, and political context in which knowledge is produced and used.

The review emphasized the relevance of problem-based or inquiry-based learning methodologies in relation to teaching issues of responsibility in research and innovation. RRI teaching should provide opportunities for participatory reflection, using real-life issues and cases that students can relate to as a basis for the learning process. Such elements of teaching should contribute to fostering a greater awareness of the interaction between the students' field of study, other areas of research and innovation, and broader society.

Other documents from the emerging RRI literature points towards teaching approaches which facilitate a collaborate relationship between the teacher and the student. In this regard, the students should be

considered as "co-inquirers", where traditional academic hierarchies are suspended in order to achieve diverse perspectives on any given subject[4]. The teacher should function as a facilitator treating the students as co-inquirers in order to foster a higher degree of voluntary participation from the students. The argument is that by being treated as responsible individuals, who are capable also of taking responsibility for their own learning processes, students are more likely to develop broader contextual responsibilities. By adopting a collaborative and hierarchy-free teaching methodology a participatory space is created for the students allowing them to participate in discussions and dialogues with focus on collective deliberation and reflection.

Finally, the review also identified several barriers in relation to RRI teaching within higher education institutions. It was highlighted that the discussion regarding responsible research and innovation already exist within several universities but that the emerging RRI agenda nevertheless is faced with several barriers. Resistance or lack of support at the level of management of HEIs and lack of incentives for the individual researcher to engage with RRI teaching are the most important obstacles identified in the review.

3. HEIRRI Database

The objective of Task 2.2 is to develop a database containing selected parts of the evidence collected during Task 2.1, the State of the Art review, and to provide open access to its contents. In the following, the approach to selecting cases for the database will be outlined.

A few contextual remarks are required. The review consisted of an array of different documents ranging from traditional academic papers to training materials, courses, EU-projects etc. The cases selected for the database were the ones considered to best illustrate the conclusions of the review and which were considered particularly relevant as inspiration for WP3 and WP4. As a consequence of the multiple sources and heterogeneous character of the review material, the selected cases are therefore not uniform and the database has been constructed to support the heterogeneity of the cases. Hence, when designing the template (Appendix A) for the database entries a special emphasis was placed on ensuring the template would be able to accommodate the heterogeneity of the cases.

As part of the objective of HEIRRI, the database should be open access. This will be achieved by integrating the database into the already existing 'RRI Tools' web platform. Within the framework of RRI Tools, contents is classified as either 'library elements' (e.g. articles, reports, journals), 'projects' (relevant to RRI), 'inspiring practices' (external resources, cases, programmes, organizations), or 'tools' (e.g. methods, guidelines, training, monitoring). Each entry in the HEIRRI database is classified

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[4] Sunderland; M. E.; Taebi, B.; Carson, C.; Kastenberg, W. (2014): Teaching global perspectives: engineering ethics across international and academic borders. *Journal of Responsible Innovation* 1/2, 228-239.

according to this scheme, but a number of complementary classificatory attributes have been used as well.

3.1   Methodology

The first step towards the development of the database has been to sort and organize the compilation of materials collected during the review. The review process compiled a great amount of different materials all related to RRI teaching in higher education institutions. The sorting task included a categorization of the various cases into library elements, projects etc. according to the structure of the 'RRI Tools' website and an elimination of doublets between the HEIRRI compilation and the contents already available at the RRI Tools platform. The different cases were also classified in relation to the six 'RRI keys'.

Of the sorted material from the review a preliminary selection of potential cases for inclusion in the database was compiled by the WP lead. These cases were selected based on a) their ability to illustrate the conclusions of the review and b) their relevance as inspiration for WP3, the elaboration of the training programme design and WP4, the development of training materials.

Subsequently, the preliminary selection was discussed by the HEIRRI consortium, and 26 entries were chosen for in-depth presentation in the database. After having selected the cases for the HEIRRI database a template for filling and fitting the empirical materials was developed (Appendix A). The template provides space for describing – for each individual entry – the actual contents of the case (what is it about), the way that it relates to RRI teaching and learning, its features in terms of pedagogical methods, the academic domain and degree levels it is relevant for, its relation to the key areas of RRI, and its alignment with the RRI Tools classification.

As a final step the cases were distributed among partners of the HEIRRI project, who completed the case descriptions for each case. The collection of case descriptions can be considered to be the HEIRRI database.

During the process of elaborating the selected entries for the database, concerns were raised regarding three cases (EU projects) originally included in the pool of 26 cases. During the exploration of these cases, they were considered only marginally useful in terms of providing concrete information regarding RRI teaching. It was decided to exclude the three cases from the HEIRRI database since they would not offer a significant contribution. The final list of entries in the HEIRRI database therefore consists of 23 cases, which will be presented in the following chapter.

4. Database descriptions

The table below encompasses an overview of the final 23 entries of the HEIRRI database. The entries have been condensed in the table below to allow for an overview of the cases. The complete description of the entries can be found in the following chapter.

The database has been structured according to the different types of entries in order to present a clear overview. The first 5 entries in the database are EU-projects relating to RRI, followed by 4 entries relating to different teaching/pedagogical approaches in higher education institutions. The next 12 entries are programmes and courses taught at various universities concerning RRI in higher education institutions. The final 2 entries consist of a policy document and a report.

Table 1: Overview of the 23 cases compiled in the HEIRRI Database

Name of course/ activity / document	Short description	Link
FOSTER; EU-project	FOSTER (Facilitate Open Science Training for European Research) is a 2-year, EU-Funded project. Its primary aim is to produce a European-wide training programme that help young researchers, established scholars, postgraduate students, librarians, and other stakeholders to incorporate Open Access approaches into their existing research methodologies. FOSTER aims to enable its stakeholders to contribute to the growing amount of freely-accessible research papers.	Training portal: https://www.fosteropenscience.eu/ http://www.rri-tools.eu/-/foster_project
IRRESISTIBLE; EU-project	The aim of IRRESISTIBLE (Including Responsible Research and innovation in cutting Edge Science and Inquiry-based Science education to improve Teacher's Ability of Bridging Learning Environments) is to design activities that make young people more aware about RRI issues and foster their involvement in RRI processes. Awareness for RRI should be raised through formal (school) and informal (science centre, museum, or festival) educational approaches.	http://www.irresistible-project.eu/images/irr-mat/IRRESISTIBLE_folder_EN_02-2014.pdf
PACITA; EU-project	PACITA (Parliaments and civil society in Technology Assessment) aims at "increasing the capacity and enhancing the institutional foundation for knowledge-based policy-making on issues involving science, technology and innovation, mainly based upon the diversity of practices in Parliamentary Technology Assessment (PTA)". Science, civil society organizations, stakeholders, citizens, parliaments and/or governments are engaged directly into activities of the project in order to gather knowledge, create common results and foster the exchange between different actors.	http://www.pacitaproject.eu/ http://www.technology-assessment.info/index.php/welcome)
ENRRICH; EU-project	'Enhancing Responsible Research and Innovation through Curricula in Higher Education' (ENRRICH) aims to improve the capacity of students and staff at HEIs to embed RRI into curricula, especially considering the research needs of society, represented by civil society organisations (CSOs). In the course of the project, good practices and relevant resources will be identified, developed, piloted, and disseminated. Furthermore, ENRRICH wants to enhance the	http://www.livingknowledge.org/projects/enrrich/

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	exchange and debate about implementing RRI in curricula across Europe.	
PARRISE; EU-project	PARRISE (Promoting Attainment of Responsible Research and Innovation in Science Education) is a European project which centres around the theme of 'socio-scientific inquiry based learning'. The purpose of the project is to provide an overall educational format for both teachers and citizens, and to establish a network/community of stakeholders with different professional profiles that would enable transaction of knowledge and rising of awareness about socio-scientific inquiry based learning application.	http://www.parrise.eu/
The Round Table: A bottom-up approach to ethics	The Round Table is a bottom-up participatory approach for addressing ethical issues of research and innovation, designed by the Swiss Science et Cité foundation.. Felt et al. (2009) adapted this design and implemented a Round Table on genome research, bringing together laypeople and scientists. They then analysed the actors' engagement and the unfolding discussions in this particular setting.	Felt, U., Fochler, M.; Müller, A., Strassnig, M. (2009): Unruly ethics: on the difficulties of a bottom-up approach to ethics in the field of genomics. *Public Understanding of Science* 18 (3), 354-371.
The Neosocratic Dialogue: discussing ethical questions of emerging technologies	The Neosocratic Dialogue (NSD) is an extension to participatory technology assessment (PTA) for addressing ethical questions of emerging technologies. NSD is considered a consensus-oriented tool that allows stronger participation of citizens in debates on ethical questions around technologies.	Birnbacher, D. (1999). The Socratic method in teaching medical ethics: Potentials and limitations. *Medicine, Health Care and Philosophy, 99*(2), 219–224.
Teaching resources: 'Engineers, Technology and Society'; University of Western Australia	'Synthesis Lectures on Engineers, Technology and Society' is a publication by Professor Caroline Baillie (University of Western Australia) that gathers a series of lectures to foster interdisciplinarity among engineers and scientists. The aim is to promote an understanding of the inclusive nature of both professions by drawing on multiple fields.	http://www.morganclaypool.com/toc/ets/1/1 http://www.morganclaypool.com/toc/ets/1/1#lecturesAvailableOnline
Community-University Research Alliances (CURA); funding programme	The Community-University Research Alliances (CURA) programme was created in January 1999. Nearly 100 CURAs have been launched since 1999, creating alliances between community organizations and HEIs and fostering mutual learning, training and innovative research based on equal partnership between the organizations from the community and the HEI.	http://www.sshrc-crsh.gc.ca/funding-financement/programs-programmes/cura-aruc-eng.aspx
STIPS; Osaka University and Kyoto University	'STiPS: Program for Education and research on Science and Technology in Public Sphere', is a postgraduate minor (sub-major programme) that fosters integrated design capacity within the field of Nanoscience.	http://www.stips.kyoto-u.ac.jp/stips_e http://stips.jp/english/
Teaching engineering ethics across international and academic borders; article	The University of Berkeley implemented a pilot programme on embedding ethics in the centre of engineering curricula. The programme was designed as an intensive, five-day summer course and brought together graduate students from different disciplines and countries.	Sunderland; M. E.; Taebi, B.; Carson, C.; Kastenberg, W. (2014): Teaching global perspectives: engineering ethics across international and academic borders. *Journal of Responsible Innovation* 1/2, 228-239.
TRREE	Training and Resources in Research Ethics Evaluation (TREE) is a consortium made of stakeholders from Northern and Southern countries. It aims to provide basic training, and build capacity, regarding ethics of health research involving humans by promoting highest ethical standards and the welfare of participants.	http://elearning.trree.org/

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	TRREE proposes to achieve this goal primarily by developing a training programme with local collaborators. The courses are designed for self-learning, and deal with ethics in general and/or specific ethical problems.	
Public Engagement Training; University College London	'Public Engagement Training' is a project developed at UCL. The aim of the project is to raise awareness of public engagement in higher education institutions and to promote public engagement in scientific research. One of the activities in relation to public engagement training is connecting students` projects with the lay public to foster interaction and cooperation among them.	http://www.ucl.ac.uk/public-engagement
Service Learning Programme; Universitat Rovira i Virgili	Service Learning is an educational approach that combines learning processes and community service in a single project, in which the participants learn while working on real needs of their environment, so they can take steps to improve it. It is a complex activity that links community service to the learning of content, competencies, skills and values through reflexive practice. The aim of the Service Learning approach is to provide reflexive practice since it establishes connections between students' service experiences and the academic curriculum.	http://www.urv.cat/aprenentatgeservei/en_index.html https://issuu.com/heirriproject/docs/service_learning_programme_at_unive
Ethics in Life Sciences; Vrije Universiteit Amsterdam	This four-week course for masters' students provides students with a toolbox of ethical instruments for research projects on ethics. Throughout the session, students enhance their critical and ethical reflexion and become equipped to handle ethical dilemmas for their future careers. This is a compulsory course in all Faculty of Earth and Life Sciences (FALW) Master programmes, except for Health Sciences and Neurosciences.	http://www.vu.nl/nl/studiegids/2015-2016/master/a-b/biomedical-sciences/index.aspx?view=module&origin=50051475&id=50043929
Theory of Science and Ethics; University of Bergen	The course addresses the relationship between science and society while encouraging students to critically reflect upon their own research. It offers intensive supervision of paper discussions, and students develop a capacity for critical reflection about ethical issues.	http://www.uib.no/en/svt/21873/course-description-vithf900-theory-science-and-ethics
Contextualizing Nanotechnology Education: Fostering a Hybrid Imagination; Aalborg University	This course fosters a so-called 'hybrid imagination', as an approach to improve the ability of students to think across disciplines and to examine the societal context for and implications of their scientific subject. It is offered to students in engineering education programmes during their first year.	http://vbn.aau.dk/en/publications/contextualizing-nanotechnology-education(d029e310-ddc7-11de-88f9-000ea68e967b).html
Dilemma game 'Professionalism and integrity in research'; Erasmus University Rotterdam	The Erasmus University Rotterdam (EUR) developed the Dilemma Game, which helps staff and students discuss dilemmas and stimulates them to find solutions. This game contains many common integrity issues and it also offers participants the opportunity to formulate dilemmas from their own practice. It uses many dilemmas in science and invites discussion on the subject. The game lets participants consider, choose and defend (and possibly reconsider) alternative courses of action regarding a realistic dilemma concerning professionalism and integrity in research.	http://www.eur.nl/english/eur/publications/integrity/dilemma_game/ http://ed.ted.com/on/uk36wtoi
Camera drones in education; University of Bergen	As part of the Bachelor programme in New Media at the Department of Information Science and Media Studies at University of Bergen, the first innovative drone course for media students is offered. In the course, the students are taught how to responsibly utilize visual technology such as drone usage as a journalistic tool.	http://www.uib.no/en/news/99154/media-students-become-drone-experts https://issuu.com/heirriproject/docs/smart_drones_for_journalism._teachi
Erasmus Intensive Program in Sustainable Technology	The course is organized around sustainability topics that are analysed through case studies situated in different contexts ranging from local to global issues. The main aims of the project are to increase the understanding of a sustainable development, increase the capability to apply foresighting, forecasting and	https://is.upc.edu/?set_language=en http://www-

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Development; Universitat Politècnica de Catalunya	backcasting and to contribute to the development of scientific work competences of the students.	csd.eng.cam.ac.uk/proceedings-of-the-eesd13-conference-cambridge-2013-v-2/eesd13-published-papers/segalas-j.pdf
Walking the city: social interactions in learning through the urban environment; Universitat Politècnica de Catalunya	'Walking the city' is a teaching practice organised by way of visits and city tours with the purpose of developing new was to understand the city and urban spaces. The aim of the programme is to promote active reflection and the profound assimilation of urban experiences in the field of teaching urbanism and deepening the students' knowledge of the city. The programme encompasses different disciplines such as architecture, sociology, and history.	https://issuu.com/heirriproject/docs/walking_the_city__social_interactio
Recommendation for Promoting Research Integrity; policy document	This policy document provided by the Irish Council for Bioethics in Ireland represents a summary of important decisions and suggestions about research integrity, supported by real world examples. The document describes several areas of research integrity, beginning with the description of research integrity concept, and then proceeding to list the core values emphasised by research integrity. Two approaches for greater integrity are described: promotional (educational) and deterrent, and these approaches can be applied differently in specific research fields.	http://health.gov.ie/wp-content/uploads/2014/07/Recommendations_for_Promoting1.pdf
Harvesting Results Preparing for the Future (Mobile Educational DNA Labs); report	This report by the Centre for Society and Life Sciences in the Netherlands starts with a brief description of genomic science development from its origins until today. The description is focused on ELSI (Ethical, Legal and Social Implications) and ELSA (Ethical, Legal and Social Aspects) programmes which are funded by numerous international agencies. One of the results of the ELSA/ELSI programmes (applied mostly in elementary schools in Netherlands) were mobile DNA labs, designed especially for educational purposes, where scientists communicate with students about the field of genomic science.	http://www.society-lifesciences.nl/

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5. HEIRRI Database

Where the former chapter presented a comprised overview of the entries for the HEIRRI database this chapter presents the full entries. These case descriptions will be integrated into the online web platform of RRI Tools.

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5.1   Database entry: "FOSTER"

FOSTER

Brief description

FOSTER (Facilitate Open Science Training for European Research) is a 2-year FP7 project of 13 partners across 8 countries whose primary aim is to "produce a European-wide training programme that help young researchers, established scholars, postgraduate students, librarians, library managers and other stakeholders to incorporate Open Access approaches into their existing research methodologies", in the context of the European Research Area (ERA) and in complying with the open access policies and rules of participation set out for Horizon 2020.

FOSTER enables its stakeholders to contribute to the growing holdings of freely-accessible research papers in Europe, to share and preserve their data productively, and prepares them to engage with and develop new knowledge communities in the digital age. FOSTER consolidates training activities at downstream level and reaching diverse disciplinary communities and countries in the ERA. Each type of stakeholder will be provided with a range of relevant training programmes, practical advice, support and help in engaging, dynamic and outcome-oriented way.

RRI teaching and learning relevance

The FOSTER project has developed the "FOSTER portal", which is an e-learning platform that brings together training resources on Open Science and on how to develop strategies and skills for implementing Open Science practices in daily workflows. To this end, several training toolkits have been developed and made openly available for re-use.
The topics of the training resources are, among many others, on Open Access, Open Data, Open Reproducible Research, Open Science Definition, Open Science Evaluation, Open Science Guidelines, Open Science Policies, Open Science Projects, Open Science Tools.

In the portal, four categories of resources are identified: Resources, Events, Questions, and Courses. It is possible to enrol in a course, or create one. Existing courses are addressed to the identified targets of the project. Examples are: "Key Skills for Open Science and Responsible Research and Innovation", "Open Science at the Core of Libraries", or "Integrating Open Science in Information Literacy education", and they are available in Portuguese, English, Spanish, Polish...

Teaching format / pedagogical characteristics

All courses are available online and for free. They all have a short introduction to the course, followed by the identified learning objectives of each case. All courses at the FOSTER portal are addressed to

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specific audiences, though many converge: Librarians and Repository managers, Researchers and Students, Project Managers, Policy makers and Funders, PhD students, Research Administration, and/or Publishers. Every course includes information of its internal learning modules, and has its own "Course Forum", where people learning can comment on the content. The teaching approach is basically e-learning and self-learning, dissemination of training materials/contents, tutorials... Some courses include a quiz to evaluate the knowledge acquired.

As described by the project, training programmes include: e-learning, b-learning (blended-learning), self-learning, dissemination of training materials/contents, helpdesk, face-to-face training, training-the-trainers, summer schools, seminars, etc. All in all, the database provides educational practices that enable the engagement between scientists and society.

Keywords
Open, science, access, data, repositories.

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
X	X	X	Many identified audiences: Project Managers, Researchers and Students, Policy makers and Funders, Librarians and Repository managers, PhD students, Research Administration, Publishers, etc

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
X			X	X			

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
	X		

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
X	X	X	X

Sources, links, further readings

Training portal: https://www.fosteropenscience.eu/

https://www.fosteropenscience.eu/project/

http://www.rri-tools.eu/-/foster_project

http://cordis.europa.eu/project/rcn/111215_en.html

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5.2 Database entry: "IRRESTIBLE"

IRRESISTIBLE

Brief description

The IRRESTISTIBLE (Including Responsible Research and innovation in cutting Edge Science and Inquiry-based Science education to improve Teacher's Ability of Bridging Learning Environments) project has been ongoing from 2013- 2016 and is funded under the European Commission FP7 framework. The project's aim is to design activities that make young people more aware about RRI issues and foster their involvement in RRI processes. Awareness for RRI should be raised through formal (school) and informal (science centre, museum, or festival) educational approaches.

In the project, "Communities of Learners" (CoL), consisting of researchers, teachers, educational specialists, and specialists in informal learning from science centres, are formed. These CoL develop thematic educational modules on controversial real-life research cases, which are based on Inquiry Based Science Education; these modules will then be used in schools. Additionally, students should visit research laboratories and develop exhibits about studied RRI issues, which should then be presented in science centres involved in the project. The best exhibits will further be presented at an international conference.

All of the training modules will be available online in different languages on the project's website (www.irresistible-project.eu).

RRI teaching and learning relevance

While the project focuses on education in school, some of their results might also be used for teaching and learning in HEIs. The developed thematic educational modules are based on Inquiry Based Science Education, which could potentially also be applied in teaching RRI in HEIs. The project focuses on teacher training: school teachers should be prepared and trained to work with their students on the respective educational modules on RRI. This "train the trainer" approach might be useful for RRI teaching and learning in HEIs, as it could serve as an input for the preparation of teachers and lecturers teaching RRI in HEIs.

The modules of the project further address research topics at the involved universities, which allow students to work on real-life cases and make RRI issues more tangible to them. Moreover, the chosen research cases are controversial, partly uncertain, and under debate, which encourages critical thinking and reflexivity. Additionally, the modules support addressing RRI issues, such as societal and environmental implications, or ethical issues.

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Teaching format / pedagogical characteristics

The project's educational approach is characterised by some major steps. First, different stakeholders form "Communities of Learners" (CoL), which develop different educational modules. These modules as well as their development are based on Inquiry Based Science Education. Second, school teachers are trained in order to train other teachers as well as to work with their students on the respective cases and RRI issues ("train the trainer"). Third, the different modules are tested and used in school classes. Fourth, students experience research-based education as the modules also include e.g. visits at research laboratories. Additionally, critical thinking and reflexivity might be encouraged as the topics of the modules address controversial and new research cases. Fifth, there is a strong active part of the modules: Students develop exhibits about the studied RRI issues/cases, which are then presented in science centres.

The project apparently works with concrete real-life cases from areas like healthy ageing, genomics, climate change, renewable energy and sustainability, nanoscience, etc. Moreover, the modules are supposed to be research-based and include site visits of students (e.g. in research laboratories), which should make the discussed issues – as well as the related RRI dimensions – more tangible.

In terms of material, students are strongly encouraged to use online tools for their work.

Keywords

Science education, train the trainer, Inquiry Based Science Education, public engagement, research-based education

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
X	X	X	Summer Schools, Workshops

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
X	X						

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
X	X	X	

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
X	X	X	X

Sources, links, further readings

Folder of the IRRESISTIBLE project: http://www.irresistible-project.eu/images/irr-mat/IRRESISTIBLE_folder_EN_02-2014.pdf

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Bertozzi, E., Fazio, C., Floriano, M. A., Levrini, O., Maniaci, R., Pecori, B., Venturi, M., & Apotheker, J. (2014). Responsible Research and Innovation in Science Education : The IRRESISTIBLE Project. In C. Fazio & R. M. Sperandeo Mineo (Eds.), *Teaching/Learning Physics: Integrating Research into Practice. Proceedings of the GIREP – MTPL 2014 International Conference* (pp. 177–183). Palermo: Università Degli Studi Di Palermo. Retrieved from http://www1.unipa.it/girep2014/proceedings/GIREP-MPTL%202014%20Conference%20Proceedings.pdf or http://www1.unipa.it/girep2014/accepted-papers-proceedings/154_Bertozzi.pdf

Gorghiu, G., Anghel, G. A., & Ion, R.-M. (2015). Students' Perception Related to a Responsible Research and Innovation Demarche. *Procedia – Social and Behavioral Sciences, 180*, 600–605. doi:10.1016/j.sbspro.2015.02.166

Maciejowska, I., & Apotheker, J. (2015). Teacher training at chemistry faculties – mutual benefits? A case study based on the example of the IRRESISTIBLE project. *Gamtamok Slinis Ugdymas / Natural Science Education, 12*(2), 104–111. Retrieved from http://oaji.net/articles/2015/514-1444756868.pdf

5.3   Database entry: "PACITA"

PACITA

Brief description

PACITA (Parliaments and Civil Society in Technology Assessment) aims at "increasing the capacity and enhancing the institutional foundation for knowledge-based policy-making on issues involving science, technology and innovation, mainly based upon the diversity of practices in Parliamentary Technology Assessment (PTA)" (http://www.pacitaproject.eu/). Science, civil society organizations, stakeholders, citizens, parliaments and/or governments are engaged directly into activities of the project in order to gather knowledge, create common results and foster the exchange between different actors.

Technology is seen as central in responding to the great challenges of society on the one hand. New emerging technologies challenge regulations and established policies on the other hand. In order to answer to those challenges, PACITA wants to spread Technology Assessment (TA) as a method to provide and support "robust and knowledge-based policy making on societal topics related to science, technology and innovation" (http://www.pacitaproject.eu/). In summer schools and practitioners' meetings, and via the establishment of a TA portal, this method was taught to different stakeholders.

RRI teaching and learning relevance

As "analytic and democratic practice which aims at broadening the knowledge base of policy decisions by comprehensively analysing the socio-economic preconditions as well as the possible social, economic and environmental impacts in the implementation of new technologies" (http://www.pacitaproject.eu/about/), TA represents the principles of RRI. PACITA introduced the method of Technology Assessment (TA) to different societal actors. Two summer schools and four practitioners' meetings were held, and a TA portal was established. The goal was to spread the method of TA across Europe in order to enable different societal stakeholder to "facilitate the mobilisation of PTA functions in their home countries" (http://www.pacitaproject.eu/action-plan-2/).

The target group of the summer schools were users and societal actors (scientists, stakeholder, civil servants, MP/MEPs etc.). The practitioners' meetings focused especially on project managers in PTA. Experienced project leaders trained newcomers in scoping and framing issues, methodology, networking and impact creation, and communication. The TA portal collects and provides TA material and information, and lists related institutions, projects, experts and publications (http://www.technology-assessment.info/index.php/welcome).

Teaching format / pedagogical characteristics

Documentation about the summer schools and the practitioners' meeting are available online, but not very extensive and they do not elaborate on teaching formats and methods used. The trainings were conducted in a workshop setting and included a mix of lecturers, workshops, and activities. After introductory talks and discussions, smaller working groups were formed.

In the summer schools, concrete topics (Renewable Energy Systems and Ageing Society) were employed to demonstrate TA. The groups got different assignments and methods to work on fictive TA projects. There were six workshop sessions: problem definition and research design, methodological aspects, communication and dissemination, and a finalisation workshop before the two groups presented their work to the plenary. This approach "allowed participants to discuss, experience, and learn about the usefulness and the relevance of TA activities for their own activities and for their wider organisational or national contexts" (http://www.pacitaproject.eu/summer-schools/).

In the four practitioners' meeting, lasting three days each, different topics stood in the focus: theme selection; methods; customers, participants and managers; as well as communication and impact strategies. The meetings were similarly designed as the summer schools as a mixture of talks, discussions, group work and presentations (http://www.pacitaproject.eu/practitioners-meetings-2/).

Keywords

(Parliamentary) Technology Assessment/Great societal challenges/Civil Society/(P)TA practitioners/TA training

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
			Not originally designed for HEI, but could be adapted for MA or PhD

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
X				X			

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
	X		

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
X	X	X	X

Sources, links, further readings
http://www.pacitaproject.eu/

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http://www.pacitaproject.eu/summer-schools/

http://www.technology-assessment.info/index.php/welcome

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5.4   Database entry: "ENRRICH"

ENRRICH

Brief description

The ENRRICH (Enhancing Responsible Research and Innovation through Curricula in Higher Education) project aims to improve the capacity of students and staff at HEIs to embed RRI into curricula, especially considering the research needs of society, represented by civil society organisations (CSOs). In the course of the project, good practices and relevant resources will be identified, developed, piloted, and disseminated. Furthermore, ENRRICH wants to enhance the exchange and debate about implementing RRI in curricula across Europe.

For this purpose, a common understanding of RRI will be developed. RRI teaching practices and material will be designed and piloted at HEIs. Science shops and similar institutions will be tested as points of exchange to support the inclusion societal needs in HEI curricula. Exchange and dialogue, mutual learning amongst project partners and on national, international and institutional level, building partnerships and involving diverse stakeholders are in the focus of the ENRRICH project in order to further their goal of including RRI into HEI curricula.

RRI teaching and learning relevance

ENRRICH can be relevant for teaching RRI in two ways. First, good practices and case studies have been collected by the consortium members that embedded RRI (or rri) in one way or the other into modules and courses in different disciplines across Europe. Those exemplary courses are mostly on a bachelor and master level and are focussed on enhancing CSO involvement. The best practices can be used as input in and inspiration for the development of RRI training programmes and can be found here: http://www.livingknowledge.org/projects/enrrich/enrrich-resources/.

Furthermore, ENRRICH developed and piloted new teaching material in higher education curricula ("ENRRICH tool"), especially focusing on developing course material on BA and MA level, including input of CSOs and science shops about research needs of society. This tool is aimed at educators to incorporate RRI into existing courses and teaching, but not primarily to design new courses. The tool is set up in a way that educators can review and reflect on their existing courses through a RRI perspective. It does not build on the six RRI dimensions, but on the more holistic approach of four competencies (anticipation, reflexivity, responsiveness and inclusiveness). See http://www.livingknowledge.org/fileadmin/Dateien-Living-Knowledge/Dokumente_Dateien/EnRRICH/D2.3_The_EnRRICH_Tool_for_Educators.pdf.

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Teaching format / pedagogical characteristics

Best practices collected by ENRRICH range from extracurricular activities that do not earn ECTS credits to different kind of university courses, but always involve some kind of reflexive and practical work, often involving CSOs or other stakeholders from society in one way or the other. Accordingly, the teaching formats vary in those displayed cases.

The train-the-trainer tool does not focus on any particular teaching formats, but encourages educators to revise their already existing courses from an RRI perspective and incorporate the topic in those courses in the future. ENRRICH distinguishes between a light and a deep approach of teaching RRI. The first one can be seen as theoretical approach of teaching related theories, concepts, methods, knowledge, cases studies in consideration of societal actors. The second one takes a more practical approach of directly confronting students with those different actors, working together with them on societal challenges.

As part of ENRRICH, the Community-Academic Research Links (CARL) initiative at the University College Cork developed a community-based participatory research (CBPR) module, including related material that can be used for free (http://www.ucc.ie/en/scishop/resources/module/#). It was originally aimed to engage PhD students, but can be adapted to other settings. CBPR is seen as an approach that embodies the principles of RRI.

Keywords

Best practice collection/train the trainer/holistic RRI/community-based participatory research/CSO engagement

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
X	X		Train-the-trainer

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
X				X	X		

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
	X	X	

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
X	X	X	X

Sources, links, further readings

http://www.livingknowledge.org/projects/enrrich/

http://www.livingknowledge.org/projects/enrrich/enrrich-resources/

http://www.ucc.ie/en/scishop/resources/module/#

http://www.livingknowledge.org/fileadmin/Dateien-Living-Knowledge/Dokumente_Dateien/EnRRICH/D2.3_The_EnRRICH_Tool_for_Educators.pdf

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5.5   Database entry: "PARRISE"

PARRISE

Brief description

PARRISE (Promoting Attainment of Responsible Research and Innovation in Science Education) is a European Project which centres around the theme of "Socio-scientific inquiry based learning". The mission of the project is to provide an overall education format for both teachers and citizens, and to establish a network/community of stakeholders with different professional profiles that would enable transaction of knowledge and rising of awareness about socio-scientific inquiry based learning application. The project is divided in seven work packages, of which the last is the evaluation. The aims of the project are divided in different levels: the basic level with the RRI context, the citizen engagement level which aims to critically examine a rapidly growing amount of scientific work, and the teacher level where application of inquiry based learning is achieved. This project is closely related to the HEIRRI project as it stresses the importance of RRI in education; however, it is primarily focused on lower education levels (elementary schools).

RRI teaching and learning relevance

PARRISE is important for RRI teaching and learning because it has a focus on four different RRI aspects: responsible research and innovation in general, the idea of citizenship education, educational approaches of teaching socio-scientific issues and inquiry based science education. It addresses different real-world cases depending on education level. Some of the examples are recycling, sustainable energy use, biotechnology and bioinformatics. Through these real-world examples, students are taught how different RRI aspects are defined, merged and applied in everyday setting. Also, they learn how to pose a question and search for different RRI aspects, allowing them to improve their critical thinking and reflexivity. By forming questions they will be able to de-construct the concept of RRI and think about it in a more creative way. The important parts of learning process are the mistake which students make, that develops their critical thinking skills. Also, at the PARRISE website stakeholders can find other projects related to RRI.

Teaching format / pedagogical characteristics

PARRISE's main focus is on socio-scientific inquiry-based learning. Inquiry-based learning is a wider concept than problem-based learning because it includes describing the problem and finding a solution, supported by facilitator (in this case a teacher) who is asking questions in order to deepen the students' knowledge. However, socio-scientific inquiry-based learning can also include entire networks of people who could contribute to knowledge development; including experts, students or citizens who

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want to participate in solution finding for real-world problems. PARRISE aims to educate primary and secondary school teachers in inquiry based learning skills with different programmes developed specifically for that particular level, all through use of real-world cases.

Keywords
Socio-scientific inquiry based learning/teachers/RRI/science literacy

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
X	X	X	Primary and secondary education levels

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
X	X				X		X

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
	X		

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
X	X	X	X

Sources, links, further readings

http://www.parrise.eu/

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5.6 Database entry: "The Round Table: A bottom-up approach to ethics"

The Round Table: A bottom-up approach to ethics

Felt, U., Fochler, M.; Müller, A., Strassnig, M. (2009): Unruly ethics: on the difficulties of a bottom-up approach to ethics in the field of genomics. Public Understanding of Science 18 (3), 354-371.

Brief description

The Round Table is a bottom-up participatory approach for addressing ethical issues of research and innovation, designed by the Swiss Science et Cité foundation (web). Felt et al. (2009) adapted this design and implemented a Round Table on genome research, bringing together laypeople and scientists. They then analysed the actors' engagement and the unfolding discussions in this particular setting.

The Round Table is a moderated, open format, promoting a dialogue between different actors. In this, all participants can actively engage in discussions and none of them are bound to a certain role, e.g., scientists should not only be seen as experts giving information to laypeople, but also participate in the debate. In the case of Felt et al. (2009), six whole-day-meetings were conducted over a period of seven months. Fourteen laypeople and seven genome researchers participated in the roundtable discussions; they also visited a laboratory. Together, the participants identified relevant issues in the first meetings, which were then discussed afterwards with regards to their societal and ethical dimensions.

RRI teaching and learning relevance

The Round Table could be used as an interactive and deliberative teaching approach that brings together students and researchers from different disciplinary backgrounds as well as other societal groups. The approach's focus could be expanded beyond ethics to other dimensions of RRI.

Through participating in a Round Table, students could experience a public engagement approach and thus learn about it from a participant's perspective. Furthermore, they could expand their perspective on research and innovation within their fields and start to reflect on their wider (ethical) implications. Inter- and transdisciplinarity could be promoted as well as the constructive interaction and assessment of the opinions and perspectives of other stakeholders.

Teaching format / pedagogical characteristics

The Round Table is based on the idea of mutual learning between laypeople and scientists. Through bringing together these different groups, they both should better understand one another and experience other perspectives. Furthermore, Felt et al. characterise their Round Table approach as a

"collective experiment in public participation (Felt et al. 2009: 358). Although their Round Table did not take place in a higher education setting, such an "experiment" could also be implemented in a course-setting with students from different disciplines and even laypeople (non-scientists).

Regarding their approach Felt et al. (2009) came to two main conclusions: (1) Arguments based on "facts" are assessed superior to those based on "values" and (2) despite the open setting controversial issues are often not addressed openly in plenary. In this regard, Felt et al. speak of "a process of 'mutual taming'".

Keywords
Round Table; mutual learning; public participation; ethics; engagement

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
	x	x	

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
x				x			

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
x			

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
x	x	x	x

Sources, links, further readings
Felt, U., Fochler, M.; Müller, A., Strassnig, M. (2009): Unruly ethics: on the difficulties of a bottom-up approach to ethics in the field of genomics. Public Understanding of Science 18 (3), 354-371.
Science et Cité (web): Dialogue science and society. http://www.science-et-cite.ch; accessed 26 July 2016.

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5.7   Database entry: "The Neosocratic Dialogue: Discussing ethical questions of emerging technologies"

The Neosocratic Dialogue: Discussing ethical questions of emerging technologies

Griessler, E., & Littig, B. (2006): Neosokratische Dialoge zu ethischen Fragen der Xenotransplantation. Ein Beitrag zur Bearbeitung ethischer Probleme in partizipativer Technikfolgenabschätzung. In E. Buchinger & U. Felt (Eds.), *Technik- und Wissenschaftssoziologie in Österreich. Stand und Perspektiven. Österreichische Zeitschrift für Soziologie. Sonderheft 8/2006* (pp. 131–157). Wiesbaden: VS Verlag.

Brief description
The Neosocratic Dialogue (NSD) is an extension to participatory technology assessment (PTA) for addressing ethical questions of emerging technologies. The paper by Griessler and Littig (2006) presents NSD using the case of xenotransplantation (XTP). NSD is considered as a consensus-oriented tool that allows stronger participation of citizens in debates on ethical questions around technologies. A NSD consists of a group of six to twelve people supported by a moderator/facilitator.

The NSD aims at initiating a reflexive process on an ethical or philosophical question of a technological development. The question also needs to have some personal relevance to the participants. Accordingly the dialogue starts with a concrete experience of one participant, which is then discussed by the group. The participants try to find a common decision and judgement to the example, while at the same time they try to find the basic assumptions underlying this decision.

RRI teaching and learning relevance
NSD could be used as a tool to initiate ethical reflection on R&I processes and potentially also reflection on other RRI dimensions. The approach also has the potential to advance critical thinking of students and could also work as a tool for strengthening interdisciplinary work, because NSD empowers participants in their ability to argue consistently, to listen actively and to interact with other people in a constructive way. A discussion group of an NSD consists of heterogeneous participants and thus has the potential to be used in interdisciplinary courses in HEIs – e.g. on questions affecting different fields of study.

Thus, a NSD could sensitise students for interdisciplinarity and raise awareness for different ethical aspects in research and innovation processes. Moreover, NSD should also enable participants to learn

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systematic ethical argumentation, which can be considered as an important tool for future researchers.An NSD revolves around a question that should be relevant to all participants and is thus not determined to a specific topic. In HEI teaching, discussed questions could be chosen from the respective field of study and thus could be very tangible to the students.

Teaching format / pedagogical characteristics

NSD not only aims at strengthening reflexivity of participants regarding ethical questions, it also tries to overcome the shortcoming of other similar tools which often disregard laypeople or groups who are not trained in the field of the discussed question. Moreover, the goal of NSD is to find consensus through collaborative deliberation in a balanced dialogue. As a teaching format in an RRI course, it could therefore be a useful tool for strengthening students' reflexivity in their own research practices/in their research/study fields. Additionally, it also trains participants (respectively students in HEIs) in systematic ethical argumentation and allows them to improve their dialogical abilities.

NSD is related to the pedagogical approach of inquiry-based learning; however, as e.g. Lam (2011) argues, NSD is more systematic than IBL as it follows more concrete steps. NSD further seems to be suitable for addressing real-life cases, as it aims to discuss questions that are personally relevant to the group participants.
While participants of an NSD do not need to have specific knowledge on the discussed question, we nonetheless suggest using such an approach at the Master level or above as students are already more familiar with their subject and research processes.

Keywords
Neo-Socratic Dialogue, methodological approach, teaching method, ethics, reflexivity

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
	x	x	

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
x				x			

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
x		x	

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
x	x	x	x

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Sources, links, further readings

Birnbacher, D. (1999). The Socratic method in teaching medical ethics: Potentials and limitations. *Medicine, Health Care and Philosophy, 99*(2), 219–224.

Lam, F. (2011). The Socratic Method as an Approach to Learning and Its Benefits (Senior Honors Thesis). Carnegie Mellon University, Pittsburgh, PA, USA. Retrieved from http://repository.cmu.edu/cgi/viewcontent.cgi?article=1126&context=hsshonors

Littig, B. (2004). The neo-Socratic dialogue. A method of teaching the ethics of sustainable development. In C. Galea (Ed.), *Teaching Business Sustainability. Volume 1: From Theory to Practice* (pp. 240–252). Sheffield: Greenfield Publishing.

5.8   Database entry: "Teaching resources: Engineering, Technology and Society"

Teaching resources "Engineering, Technology and Society" University of Western Australia

Brief description

 "Synthesis Lectures on Engineers, Technology and Society" is a publication by Professor Caroline Baillie (University of Western Australia) that gathers a series of lectures to foster interdisciplinarity among engineers and scientists. That is, it wants to promote an understanding on the inclusive nature of both professions by drawing on multiple fields. The book is addressed particularly to practicing engineers and human resource trainers, but also faculty members of engineering, science and social sciences schools. They can help trainers promote in-depth debates and research in the classroom.

RRI teaching and learning relevance

This is an exemplary case for the HEIRRI database because it is centered on the idea that technologies need to be inclusive as they affect us all, "regardless of national boundaries, socio-economic status, gender, race and ethnicity, or creed". Also, the series become a platform for the debate of "important and sometimes controversial lectures to encourage discussion, reflection and further understanding". They combine expertise in sociology, political economics, philosophy of science, history, engineering, engineering education, participatory research, development studies, sustainability, psychotherapy, policy studies, and epistemology, and they aim at being relevant to all engineers around the world.

The series of lectures have been published by the author with the notion that, in order for engineers to be able to "make appropriate decisions and to co-create ideas and innovations within and among the complex networks of communities which currently exist", they need to realise the social and natural implications of their decisions, the significance of their work and also they have to take responsibility, developing an "ability to respond to emerging needs of all people across cultures".

Teaching format / pedagogical characteristics

The teaching format is based on lectures, which give ideas and tools to introduce the way engineers relate to their communities, "drawing on scholarship from science and technology studies, globalisation and development studies, as well as work in science communication and dialogue". It also promotes critical thinking in engineering in order to make ethical and responsible decisions. The publication also provides case studies of everyday issues such as water, garbage and alarm clocks.

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Some of the lectures are: "Engineering Ethics: Peace, Justice, and the Earth", "Mining and Communities: Understanding the Context of Engineering Practice ", "Engineering and War: Militarism, Ethics, Institutions, Alternatives", "The Garbage Crisis: A Global Challenge for Engineers", "Engineers, Society, and Sustainability", "A Hybrid Imagination: Science and Technology in Cultural Perspective", or "Tragedy in the Gulf: A Call for a New Engineering Ethic", among many others.

Keywords
Engineering, Technology, Society, Lectures, Interdisciplinarity

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
X			

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
X				X			X

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
X			

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
X			X

Sources, links, further readings
http://www.morganclaypool.com/toc/ets/1/1

http://www.morganclaypool.com/toc/ets/1/1#lecturesAvailableOnline

https://www.amazon.com/Engineering-Society-Synthesis-Engineers-Technology/dp/1598296620

5.9   Database entry: "Community-University Research Alliances (CURA)"

Community-University Research Alliances (CURA)

Brief description

The Community-University Research Alliances (CURAs) programme was created in January 1999 by the Social Sciences and Humanities Research Council of Canada, which is a federal agency that promotes and supports university-based research and training in the social sciences and humanities. Nearly 100 CURAs have been launched since 1999, creating alliances between community organizations and HEI's and fostering mutual learning, training and innovative research.

A CURA is based on the principle of an equal partnership between organizations from the community and one or more HEI. The specific objectives of CURAs are:

- To promote sharing of knowledge, resources and expertise between post-secondary institutions and organizations in the community;
- To enrich research, teaching methods and curricula in post-secondary institutions;
- To reinforce community decision-making and problem-solving capacity;
- To enhance students' education and employability by means of diverse opportunities to build their knowledge, expertise and work skills through hands-on research and related experience.

RRI teaching and learning relevance

CURA's are based on mutual learning, training and innovative research. In each alliance formed, partners are free to jointly define their research activities and the participatory arrangements under which individual researchers and research teams will carry out those activities. The people who designed the original conception of CURA were inspired, among others, by the experience of Science Shops in Europe.

In short, a CURA is an equal partnership between organizations from the community and one or more HEI, which is in charge of providing coordination and support for diversified research activities centred on areas of mutual importance for the parties. In that sense, and to meet the needs of the two parties involved, each CURA activity has a research component, an education and training component and a knowledge-mobilization component. Knowledge mobilization is based on two ideas: first, that valid knowledge is produced by many actors outside universities and research centres; and second, that research should aim at producing results that are relevant beyond intrinsic academic interest, that contribute to better policy-making and bring benefits beyond monetary terms.

Teaching format / pedagogical characteristics

The pedagogical method of CURAs is a university-based approach centred on mutual learning and participatory research. Students can benefit from the experience of practical internships in communities, which at the same time, also benefit from the interaction. The two parties learn how to work together effectively. This methodology is a participatory research approach, and training is focused on social sciences and humanities.

According to the document "Participation of Civil Society Organisations in Research" (2009), most research teams participating in CURAs found it hard to evaluate the middle- and long-term results of their activities with regard to the social, cultural, or economic development of communities, or on policies, or on teaching methods. The document points out that CURA succeeded at improving the resources and information flows within community networks and also at helping community organisations to develop sustainable relationships with one another.

Keywords

Community, university-based, alliance, mutual, learning.

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
X	X		Alliances between community organizations and HEI's

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
X	X		X			X	

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
	X		

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
		X	

Sources, links, further readings

http://www.livingknowledge.org/fileadmin/Dateien-Living-Knowledge/Library/Project_reports/STACS_Final_Report-Partic.research_2009.pdf

http://www.sshrc-crsh.gc.ca/funding-financement/programs-programmes/cura-aruc-eng.aspx

Case: https://crwdp.ca/en/council-canadians-disabilities-community-university-research-alliances-

cura-project

5.10 Database entry: "STIPS"

STIPS

Brief description

"STiPS: Program for Education and research on Science and Technology in Public Sphere", is a postgraduate minor (sub-major programme) that fosters integrated design capacity within the field of Nanoscience. This programme is a human resource development initiative jointly offered by Osaka University and Kyoto University.

STiPS was created in January 2012 under the Science for RE-designing Science, Technology and Innovation Policy (SciREX) program of the Ministry of Education, Culture, Sports, Science and Technology. It is dedicated to research and education on ethical, legal, and social issues of science and technology and is committed to the development of policy making through SciREX.

RRI teaching and learning relevance

This programme is exemplary for RRI teaching and learning because it enhances flexibility in terms of enrolment and promotes interdisciplinarity. STiPS aims to educate in order to "transcend the borders of specializations, understand issues related to science, technology and society from various angles, and contribute to the process of policy making" by linking academia, policy and society. It focuses on education and gives participants the opportunity to become involved in public engagement in the fields of science and technology.

Teaching format / pedagogical characteristics

The pedagogical methods of this programme are based on hands-on experiences in social collaboration between the academia and the social sectors. By promoting participation of citizens and NGOs/Non-profit Organizations in public activities, STiPS is contributing to the development of science, technology, and innovation policies. It is also helping to "draft and plan research and development that truly reflect the needs, situations, and issues of local society".

Keywords

STiPS, Nanoscience, Osaka, Kyoto, postgraduate

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Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
	X (postgraduate)	X (postgraduate)	

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
X	X					X	

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
	X		

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
X	X		

Sources, links, further readings

http://www.stips.kyoto-u.ac.jp/stips_e

http://stips.jp/english/

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5.11   Database entry: "Teaching engineering ethics across international and academic borders"

Teaching Engineering ethics across international and academic borders

Brief description

The University of Berkeley implemented a pilot programme on embedding ethics in the centre of engineering curricula. The programme was designed as an intensive, five-day summer course and brought together graduate students from different disciplines and countries.

The first day was used to discuss different perspectives on engineering ethics. Practical examples of research opportunities were introduced. On the second day, researchable ethical questions were commonly developed and worked on with the goal of writing research papers by the participating engineering, philosophy and social science students interdisciplinarily.

The third day included a field trip to strengthen the personal relationship amongst students and between students and teachers. On the fourth day, theory and practice of collaborating across disciplines were discussed on an individual, conceptual and institutional level. The last day was originally dedicated to discussing teaching engineering ethics, but – following the wishes of the students – was used to further work on the research projects.

RRI teaching and learning relevance

The programme is relevant as an example of trying to implement ethics in the core of a discipline – in this case engineering – by engaging students from different fields and highlighting practical ways to do so. The students were encouraged to work interdisciplinarily and to deal with views and perspectives of other disciplines. By identifying engineering ethics research opportunities, the field was pointed out as a viable career option.

Sunderland et al. (2014) highlight still existing barriers for engineers who want to deal with research ethics: there are the disciplinary boundaries of relevant journals that are dedicated either to engineering or ethics, but not to the connection of both. Often, activities related to research ethics have a low institutional status. They also emphasised the increasing demand to work interdisciplinary

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and include ethical considerations into research processes.

In the programme at Berkeley, students were seen as 'co-inquirers' in developing engineering ethics research and teaching. Their perspective and capacity was considered important in contributing to the development of effective pedagogical programmes in R&I. The creation of a safe space for "non-academic" discussions about engineering ethics, which are often unwelcome in academic settings, helped to facilitate this contribution.

Teaching format / pedagogical characteristics

The described course takes the format of a summer school for graduate students, lasting five days. In this week of collaboration, a space was created for dealing with different aspects of ethics in engineering. The programme was set up internationally, interdisciplinarily and cross-methodological. Students were encouraged to learn from and with each other. Traditional academic hierarchies and divisions between students of different disciplines and between students and teachers were broken down in order encourage different perspectives on (teaching) ethics in engineering. The emphasis of personal relationships between all participants was meant to strengthen the interdisciplinary and international exchange.

The programme was student-centred, collaborative inquiry in a non-hierarchical environment was used as a method of knowledge production. A problem-based learning model prompted students to follow their own ideas and research questions in the field of engineering ethics. Students were encouraged to articulate their perspective in their own language that did not necessarily need to be academic. Students' perspectives were seen as critical for the development of effective educational programmes. Engaging students' emotions about ethical issues and questions in engineering was used as a method to connect to the subject and show their role in moral decision-making and learning. In that way, ethics should be experienced as integral part of engineering and not as something marginal.

Keywords

Engineering ethics/interdisciplinary collaboration/student engagement/graduate education/emotional involvement

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
	X	X	

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
X				X			

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
X			

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Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
x			

Sources, links, further readings

Sunderland; M. E.; Taebi, B.; Carson, C.; Kastenberg, W. (2014): Teaching global perspectives: engineering ethics across international and academic borders. Journal of Responsible Innovation 1/2, 228-239.

Roeser, S. 2012. "Emotional Engineers: Toward Morally Responsible Design." Science and Engineering Ethics 18 (1): 103–115.

Sunderland, M. E. 2013. "Using Student Engagement to Relocate Ethics to the Core of the Engineering Curriculum." Science and Engineering Ethics 2013, 1–18.

Sunderland, M. E. 2014. "Taking Emotion Seriously: Meeting Students Where They Are." Science and Engineering Ethics 20 (1): 183–195.

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5.12   Database entry: "TRREE"

TRREE: Training and Resources in Research Ethics Evaluation

Brief description

Training and Resources in Research Ethics Evaluation (TREE) is a consortium made of stakeholders from Northern and Southern countries. It aims to provide basic training, and build capacity, regarding ethics of health research involving humans by promoting highest ethical standards and the welfare of participants. TRREE proposes to achieve this goal primarily by developing a training programme with local collaborators. It also provides free-of-charge access to e-Learning (a distance learning program and certification on research ethics evaluation) and e-Resources (a participatory web-site with international, regional and national regulatory and policy resources). The courses are designed for self-learning, and deal with ethics in general and/or specific ethical problems.

RRI teaching and learning relevance

TRREE is a very important tool for learning about research ethics. The modules are accessible in several languages, allowing for a wider audience. After passing the exam, every student receives a certificate which is certified by several medical organizations. The aim of the TRREE is to develop knowledge and skills of those participants who are engaged in management or conducting of research ethics evaluation and research partnerships. Also, it is a tool for dissemination of knowledge among countries that participate in the project. Additionally, through the ethics training, the participants can highly improve their reflexivity.

Teaching format / pedagogical characteristics

This e-programme consists of six lecture-based modules supplemented with real world examples. Although initially developed for African countries, the project is expanding to other countries. The main advantage of the programme is learning at one's own pace. The disadvantage, from a RRI standpoint, is that it describes only a single RRI aspect in detail (ethics), while other RRI aspects remain neglected. However, in terms of research ethics it is a very user friendly and interesting material. TRREE is the most suitable as an introductory e-course for novices in the field of ethics. The students start with the first module where general themes in research ethics are described, and then proceed to the more specific themes. This can lead to the development of critical reasoning and serve as basis for further application in other fields.

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Keywords

Ethics/e-learning/open access/beginners/health research

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
x	x	x	

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
				x			

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
		x	x

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
	x	x	

Sources, links, further readings

http://elearning.trree.org/

5.13   Database entry: "Public Engagement Training"

Public Engagement Training

Brief description

The public engagement training is project developed at the London's Global University UCL. The aim of the project is to raise awareness of public engagement in higher education institutions and to promote public engagement in scientific research. On the UCL website, stakeholders may find information about the project and public engagement in general. One of public engagement training activities is connecting students` projects with the lay public to foster interaction and cooperation among them. Also, the public engagement training programme has the informal interaction called the *Bright club,* which is a stand-up comedy show where scientists are performers and talk about their own work. The target population are people 20-50 years old, while the performance themes constantly change in order to keep the event interesting and to allow new performers on the stage. This project covers only a part of RRI themes, but it thoroughly examines the aspects of public engagement.

RRI teaching and learning relevance

The project website offers huge spectrum of information about public engagement in general. Also, it provides additional resources and links where stakeholders can expand their knowledge and/or engagement in scientific research. The website is user-friendly; suitable even to younger students not familiar with public engagement. Furthermore, experienced researchers may benefit from public engagement training because it keeps them up with new projects, and on *Creating Connections* event they get the chance to introduce other researchers in their field (or any other) and find research themes which could be of mutual interest. Furthermore, visitors can subscribe to a newsletter at Public Engagement Training website allowing them to be up to date with the new events.

Teaching format / pedagogical characteristics

Public engagement training is the most suitable tool for e-learning of public engagement development. However, younger students will most likely need guidelines for the website itself. Before jumping to project themes and creating connections, the public engagement lecture must be listened to. For more experienced students and researchers, the *Bright club* and *Focus on the positive* events may be a better source of new information and ideas. Also, it allows for direct comments of stakeholders. Project engagement website provides a lot of examples of public engagement and that can be a basis for problem based learning. There are also guidelines for project managers (or students) on how to improve public engagement of own projects and how to evaluate them. In short, Public engagement

website can be very helpful tool for public engagement learning if it is combined with lectures where themes and the importance of public engagement are thoroughly explained.

Keywords

Public engagement/training/UCL/Bright club/learning

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
X	X	X	

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
X							

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
	X	X	

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
X	X	X	X

Sources, links, further readings

http://www.ucl.ac.uk/public-engagement

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5.14   Database entry: "Service Learning Programme

Service Learning Programme

Brief description
Service Learning (SL) is an educational proposal that combines learning processes and community service in a single project, in which the participants learn while working on real issues from their community. At Universitat Rovira i Virgili (URV) the initiative started in 2011-2012 and it encourages students to make an active commitment to their social surroundings. It is a complex activity that links community service to the learning of content, competencies, skills and values through reflexive practice.

The aim of the Service Learning programme is to provide reflective practice since it establishes connections between students service experiences and the academic learning curriculum. The program attempts to combine community service and work experience with the academic curriculum thereby fostering reflective and responsive students that are able to understand how to positively impact their environment. The program additionally is able to enhance the social function of the university because of the close interlinkage with the local community and the community-based research that is a product of the programme.

RRI teaching and learning relevance
The Service-Learning is a training project with social benefits for the community that combines societal needs with higher educational institutions. It is an educative proposal merging from learning processes and civic engagement, combined within one project. In addition to this, the Service-Learning aims to provide reflective practice because it establishes connections between students' service experiences and the academic learning curriculum. The participants are doing training while responding to an actual community need that is recognized by the community and they are able to improve their local community through their training and research. Because Service Learning combines academia with societal actors there is a strong focus on developing interdisciplinary skills among the students.

In other words, the program aims to combine community service and curricular learning for the students as well as performing research. The programme raises the public awareness of the students participating and their civic awareness. By participating in the project, students are made aware of how they can positively impact their community.

Teaching format / pedagogical characteristics
Service learning combines the learning process of the students with community services thereby

increasing the students' awareness of societal needs. In the academic year of 2014-2015 the students at Universitat Rovira i Virgili have completed 167,000 social service hours in their local community. The innovative teaching format of Service Learning where research, teaching and community service are intertwined enhances the student's civic engagement while fostering interdisciplinary skills. It further strengthens the relationship between the university and the local community, since the university is conducting research that directly benefits the local community. The fulfillment of the universities social responsibility towards its local community is heightened due to this teaching method.

Because the programme focuses on real-life cases there is a high degree of stakeholder inclusion incorporated into the programme since the students are required to both identify community needs and contact the relevant societal actors. This method encourages the students to maintain a close relationship with the local community and enhances their public engagement. As of last year 101 community organizations were involved in various Service Learning courses at Universitat Rovira i Virgili.

Keywords
Society, interdisciplinarity, doing by learning, engagement, collaboration

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
x	x		

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
x						x	x

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
x			

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
	x	x	x

Sources, links, further readings

http://www.urv.cat/aprenentatgeservei/en_index.html

Video Service Learning Programme at URV: https://www.youtube.com/watch?v=l7QQIMsoH3Q

Framework document for the Service-Learning programme Universitat Rovira i Virgili:
http://www.urv.cat/media/upload//arxius/Aprenentatge%20Servei/DM_APS_eng.pdf

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https://issuu.com/heirriproject/docs/service_learning_programme_at_unive

http://www.linkinglondon.ac.uk/downloads/glas/glas-cce-deliverables/CCE_CS_Six_URV-Service-Learning%20Case%20Study.pdf

5.15 Database entry: "Ethics in Life Sciences"

Ethics in Life Sciences

Brief description

The course "Ethics in Life Sciences" is a four-week programme for masters' degrees that provides students with a toolbox of ethical instruments for research projects on ethics taught at Vrije Universiteit Amsterdam. Throughout the session, students enhance their critical and ethical reflexion and become equipped to handle ethical dilemma for their future careers. This is a compulsory course in all Faculty of Earth and Life Sciences (FALW) Master programmes, except Health Sciences and Neurosciences.

The main objective of the course "Ethics in Life Sciences" is to provide with a toolbox of ethical instruments to properly analyze moral problems related to research in the life sciences; to acquire conceptual knowledge of the central concepts in applied philosophy and professional ethics; to challenge an ethical reflection on one's life science specialization and to open it for an impartial and constructive discussion; to exercise a team based project to prepare and execute a moral dialogue; and finally, to acquire the necessary skills to handle ethical issues in an accountable manner, as a professional academic beyond one's own inclinations and prejudgments.

RRI teaching and learning relevance

This case is relevant for RRI teaching because it connects two disciplines like Ethics and Life Sciences, and promotes a reflection and debate on the issue. The content of the course has been built based on the idea that life sciences' research generate vital knowledge for society and that, therefore, professionals should be accountable for their decisions, experimental designs and presentation of results.

This is not a course only focused on the RRI concept, but particularly on Ethics applied to the Life Sciences, during which the RRI concept is explained and discussed. The topic of "Ethics" is presented in a way that leads to understanding and making R&I more responsible, and in any case Ethics are intended to be perceived as an obstacle. Students are encouraged to engage in moral dialogues and ethical reflections and dilemmas, raising awareness and stimulating them into thinking that ethical considerations are a vital part of being a researcher.

Teaching format / pedagogical characteristics

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The course format is structured with cases of technology ethics and medical ethics, with Problem-based Learning (PBL), simulations by role playing exercises on real research protocols, and also with small group training projects and engaging in ethical debates among teams.

"Ethics in the Life Sciences" is a four-week fulltime course that counts as 3 ECTS. The total 80 hours are distributed as follows: 13 hours in lectures, 17 hours in work groups, 24 hours in group assignments, 20 hours in reading (self-working), 2 hours doing the exam, and 4 hours in the presentation. The course is evaluated through the exam (50%), written and verbal execution of the ethical dialogue (40%) and also through the degree of intellectual participation in the workgroups (10%).

Keywords
Ethics, Life, Sciences, Course, Technology

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
	x		

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
				x			

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
	x		

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
x	x		

Sources, links, further readings

http://www.vu.nl/nl/studiegids/2015-2016/master/a-b/biomedical-sciences/index.aspx?view=module&origin=50051475&id=50043929

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5.16   Database entry: "Theory of Science and Ethics"

Theory of Science and Ethics

Brief description

The course "Theory of Science and Ethics" addresses the relationship between science and society while encouraging students to critically reflect upon their own research. Students enhance their critical reflection of ethical issues by offering intensive supervision of paper discussions. The course aims at giving an overview of key topics in theory of science, such as the relationship between science and society, normative issues related to science, and ethical issues in science (including research ethics), and philosophy of science. It also aims at offering students an arena and opportunity to reflect critically upon their own research.

The course is equivalent to 10 ECTS and is imparted at PhD level at Bergen University. It is available for all students enrolled in the PhD programme at the Faculty of Humanities and at NHH/Professional and Intercultural Communication.

RRI teaching and learning relevance

The course consists of four parts: a 4-day seminar in theory of science and ethics, the supervision of a paper discussing problems in theory of science and/or ethics relevant for the student's own project, a presentation and discussion of the paper, and the commenting upon 2 papers written by peers.

The learning outcomes expected to be achieved upon the completion of the course and the presentation and discussion of the paper, are knowledge of general problems of theory of science and ethics and the ability to identify and discuss in detail problems in theory of science and/or ethics that are directly relevant to the student's project (or to the field of study in which the project belongs).

Teaching format / pedagogical characteristics

The teaching methods consist in a four-day seminar with lectures, discussions, group and individual assignment. It is accompanied by the supervision of papers in groups and/or individually, plus the discussion of paper with the assessment committee members and peers.

The mandatory requirements for the course include preparing for and participating in the seminar in the theory of science and ethics, writing a paper in theory of science and ethics (submitted electronically), taking part in paper supervision, and providing with comments of papers produced by two peers after their presentations. The evaluation is done by the assessment committee after attending the paper presentation (public lecture of 30 minutes of duration) and the following discussion among committee members and peers (for 45 minutes).

Keywords
Ethics, Science, Society, Philosophy, PhD

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
		x	

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
x				x			

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
	x		

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
		x	

Sources, links, further readings
http://www.uib.no/en/svt/21873/course-description-vithf900-theory-science-and-ethics

http://www.uib.no/en/svt/21463/mnf490-course-theory-science-and-ethics-faculty-mathematics-and-natural-sciences-uob-fall

5.17 Database entry: "Contextualizing Nanotechnology Education: Fostering a Hybrid Imagination"

Contextualizing Nanotechnology Education: Fostering a Hybrid Imagination.

Brief description

This course fosters a so-called 'hybrid imagination', as an approach to improve the ability of students to think across disciplines. It is based on the idea that, in "the context of worldwide economic and environmental crisis, it is increasingly important that nanotechnology, genomics, media engineering and other fields of 'technoscience' with immense societal relevance are taught in ways that promote social responsibility and that educational activities are organized so that science and engineering students will be able to integrate the 'contextual knowledge' they learn into their professional, technical–scientific identities and forms of competence" (Jamison & Mejlgaard 2010).

Aalborg University (Denmark) believes that a socio-cultural approach is needed to be able to properly contextualize learning in a way that contributes to a greater sense of social responsibility on the part of scientists and engineers. They state: "the social, political and environmental challenges facing science and engineering in the world today require the fostering of what we have come to call a 'hybrid imagination', mixing scientific–technical skills with a sense of social responsibility or global citizenship, if science and engineering are to help solve social problems rather than create new ones" (Jamison & Mejlgaard 2010).

RRI teaching and learning relevance

The aim of the course is to give students in engineering programmes, specifically in nanotechnology and biotechnology, a sense of the broader context of their field. It invites reflection on the societal implications of their work, and provides a set of skills needed for understanding and analysing the responsibilities engineers have in their professional work.

Teaching format / pedagogical characteristics

The course is taught as a mandatory component during the first year of the Bachelor's programme. It is based on Problem-based learning as a guiding pedagogical approach. Importantly, the course is integrated with the student's semester project report, which has a strong technical focus but which should also cover the students' 'contextual knowledge', acquired during the course and through the project work. Normally there is an empirical focus and use of appropriate social science methods in this regards, such as interviews with stakeholders, focus groups, or survey based data collection. The project report is supervised by scientists and social scientists together, and the examination is also carried out in collaboration.

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Keywords

Hybrid imagination, technoscience, science and engineering education, contextual knowledge

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
x			

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
x							

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
x			

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
x			x

Sources, links, further readings

http://vbn.aau.dk/en/publications/contextualizing-nanotechnology-education(d029e310-ddc7-11de-88f9-000ea68e967b).html

http://www.tandfonline.com/doi/full/10.1080/09505430903512911

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5.18   Database entry "Dilemma game `Professionalism and Integrity in Research´"

Dilemma game ´Professionalism and Integrity in Research´

Brief description
The Erasmus University Rotterdam (EUR) developed the Dilemma Game, which helps staff and students discuss dilemmas and stimulates them to find solutions. This game contains many common integrity issues. It also offers participants the opportunity to formulate dilemmas from their own practice.

Besides the existing general Dilemma Game, a game specifically focusing on Professionalism and Integrity in Research was developed as one of the initiatives of the EUR Taskforce Scientific Integrity. It uses many common dilemmas in science and invites discussion on the subject. The game lets participants consider, choose and defend (and possibly reconsider) alternative courses of action regarding a realistic dilemma regarding professionalism and integrity in research. Participants will also come to appreciate the dilemmas that others are faced with, how they resolve them and the reasoning behind these solutions, fostering to help one another to find solutions for their own dilemmas.
The dilemma game is available (in English) in a 'tangible' box-format. There is also an online version which you can find here.

RRI teaching and learning relevance
By exposing to such dilemmas in the context of a critical dialogue, the game creates an open forum supporting participants in further developing their own "moral compass". This open learning space also bares individual researchers to dilemmas in a group discussion and raises awareness for and to develop proposals to help maintain scientific professionalism and integrity.
Moreover, the 75 dilemmas included in the game have been collected through sessions at different EUR schools and among researchers who use different research strategies and who are in different stages of their careers. In that way, the game develops a set of dilemmas that are relevant to a diverse population of researchers.

While these dilemmas are based on actual cases, they are recognizable and relevant to many researchers, stimulating a more open and critical discussion of their respective norms and behaviours. The outcomes of the debate sessions will be also helpful for a diverse population of researchers interested principles of good scientific teaching and research.

Teaching format / pedagogical characteristics

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The pedagogical methodology of the Dilemma game 'Professionalism and integrity in research' has a clear participatory approach based on gamification, focused on scientific integrity research. Depending on the objectives, it may be used primarily as an exercise to let people exchange opinions and experiences, or also as a step towards defining more formally defined principles, on for instance co-authorship. The Dilemma game operates as an inquiry-based learning platform in which students acquire higher order thinking skills within research ethics.

It is also based on real-life cases and it lets participants come up with their own dilemmas, after playing a number of dilemmas from the game.

The game can be used in a variety of teaching and scenarios in Higher Education institutions, such as in a course setting, for instance for a group of PhD students, or in a research strategy meeting of a department or institute.

Keywords

Gamification, university-based, mutual learning, scientific integrity, critical discussion

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
X	X	X	

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
	X			X			

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
X			

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
X	X	X	X

Sources, links, further readings

General info: http://www.eur.nl/english/eur/publications/integrity/dilemma_game/

Download Dilemma Game: http://www.eur.nl/fileadmin/ASSETS/ieb/integriteit/dilemmagame-mrg.pdf

Final report of the Taskforce Scientific Integrity Erasmus University Rotterdam October 2013
http://www.eur.nl/fileadmin/ASSETS/ieb/integriteit/Taskforce_Scientific_Integrity_EUR.pdf

TEDed video 'Gamification of education' http://ed.ted.com/on/uk36wtoi

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5.19   Database entry: "Camera drones in education"

Camera drones in education

Brief description

As part of the Bachelor Programme in New Media at the Department of Information Science and Media Studies at University of Bergen they offer the first innovative drone course for media students. In the course the students are taught how to responsibly utilize visual technology such as drone usage as a journalistic tool.

The course is offered by ViSmedia (Responsible Adoption of Visual Surveillance Technologies in the News Media) a research group funded by the Norwegian Research council. The drone course is experimental and stimulates students and teachers alike in the innovative use of camera work with smart drones with its visually technical challenges.

As part of the course "Camera drones in education" the ViSmedia researchers guide the innovation process by discussions and evaluations with the students in a series of four workshops. Finally the media students have the responsibility designing a prototype for drone journalism as part of their innovation pedagogical approach.

RRI teaching and learning relevance

The aim of the course is to teach the students to conduct responsible journalism while implementing new technology. The course applies RRI teaching through participatory learning by making the students aware of the implications their practice has and by making the students anticipate and systematically reflect on this implication. The learning outcomes of the course are that students make independent decisions regarding drone flying and the risks involved, that they consider the potential of using a new technology and finally that they create genuinely novel and valuable technologies for journalism.

In relation to the usage of new technology in media the course explores two essential aspects of responsibility. The course is focused on avoiding danger hence the students are made aware that using drones can potentially be dangerous for the pilot as well as bystanders. Secondly the course is focused on the principles journalism. That journalism is bound by ethical requirements and expectations regarding accountability, relevance and that the usage of journalism drone filming should not be used as a surveillance activity. When using drone filming the students must present a transparent operational manual with a clearly stated purpose.

Teaching format / pedagogical characteristics

The project employs the approach of "innovation pedagogics" in which the students are taught to be creative and daring. Students and researchers work together in this experimental course, where the

practical aspects of the course help students identify new areas of usage and applications for the projects they are involved with.

Throughout the course the ViSMedia research guide the innovation process by continuously discussing and evaluating the project with the students, thereby fostering a hierarchy free environment for the students to unfold their creativity. The teaching format of the course is group-based and at the end of the bachelor programme, every student will gain experience in a company where they will practise innovation in a real work situation.

Keywords

Innovative journalism, responsible communication, participatory, experimental, new technology

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
x			

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
x							x

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
x			

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
		x	x

Sources, links, further readings

http://www.uib.no/en/news/99154/media-students-become-drone-experts

http://www.uib.no/en/infomedia/94035/vismedia-%E2%80%93-visual-surveillance-technologies-and-journalism

https://issuu.com/universitetet_i_bergen/docs/uib_magazine_2016_issuu/34

https://issuu.com/heirriproject/docs/smart_drones_for_journalism._teachi

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5.20   Database entry: "Erasmus Intensive Program in Sustainable Technology Development"

Erasmus Intensive Program in sustainable Technology Development

Brief description

The International Seminar on Sustainable Technology Innovation is a course centered in the framework of the master of Sustainability at the UPC-Barcelona Tech University and financed by the ERASMUS Intensive Program scheme. The course is organized around sustainability topics that are analysed through case studies situated in different contexts ranging from local to global issues. Since 2008 the course has dealt with issues such as water sanitation and treatment, overfishing and marine ecosystem degradation. The main aims of the project are among other aspects to increase the understanding of a sustainable development in the long term and the role of technology embedded in systems, increase the capability to apply foresighting, forecasting and backcasting and to contribute to the development of scientific work competences of the students.

The course is structured in different phases, where the students firstly analyse a sustainability issue in their own country context, then the students are grouped in multidisciplinary teams to discuss an international context and finally the course is run over a two week period in Barcelona and evaluated. The course has been ongoing for seven years with participation of more than 250 students, 40 lecturers and 80 stakeholders from 18 countries.

RRI teaching and learning relevance

The course employs a problem-based learning approach with back-casting as its primary method. By adopting a back-casting method the students across intercultural boundaries must attempt to access the feasibly of a desired future together. This is done through constructive-learning activities that are focused on the connections between technology development, environmental problems and societal change. The aim is to escape from only technological solutions and to explore whether the real sustainability changes in sustainable issues come from creativity, interdisciplinary, systemic and critical thinking.

A core element of the course is the focus on transdisciplinary competences since the students are from different countries and usually have different academic background it is essential to foster interdisciplinary skills in order to achieve the best sustainable strategies. The course exploits community-oriented cases thereby bringing together academia and various stakeholders as well as social organisations from society in an attempt to develop sustainable strategies.

Teaching format / pedagogical characteristics

The course is situated in an international environment and since the creation of the course students from 39 different nationalities have participated. The content of the lectures and dialogues is defined by a transdisciplinary committee in order to ensure the most innovative and updated lectures on each issue are provided.

The course adopts a problem-based learning approach with stakeholders' dialogues and discussions at the centre since this approach fosters interdisciplinary and intercultural awareness among students. The course employs scenario methodologies to the case studies in order to set up the most contextualized sustainability strategies. The problem-based approach is combined with a back-casting method, where the students through a deliberative process must define a desired future solution to the sustainability issue together.

Keywords

Sustainability, multidisciplinary, critical thinking, creativity, long term

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
	X	X	

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
X							X

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
X			

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
			X

Sources, links, further readings

https://is.upc.edu/seminaris-i-jornades/seminaris/std-2014

https://is.upc.edu/seminaris-i-jornades/seminaris/-1

https://is.upc.edu/?set_language=en

https://issuu.com/heirriproject/docs/multicultural_constructive_communit

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Segalàs, Jordi & Tejedor, Gemma "*ERASMUS Intensive Programme in Sustainable Technology Development: Multicultural Constructive Community Learning courses for EESD applying Backcasting*" Engineering Education for Sustainable Development, Cambrigde, UK. September 22-25, 2013. http://www-csd.eng.cam.ac.uk/proceedings-of-the-eesd13-conference-cambridge-2013-v-2/eesd13-published-papers/segalas-j.pdf

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5.21   Database entry: "Walking the City: Social Interactions in Learning through the Urban Environment"

Walking the City: Social Interactions in Learning through the Urban Environment

Brief description

'Walking the city' is a teaching and research inspiring practice organised by way of visits and city tours, developed at the Universitat Politècnica de Catalunya Escola Tècnica Superior d'Arquitectura de Barcelona in 2004 with the purpose of developing new was to understand the city and urban spaces. The aim of the programme is to promote the active perception and the profound assimilation of urban experiences in the field of teaching urbanism and deepening the students' knowledge of the city. By utilizing public space, neighbourhoods and social housing as themes the programme introduce the students to city planning as well as the sociology and history of the city. The programme encompasses different disciplines such as architecture, urbanism, sociology, history and as part of its components.

The project has won prestigious awards for quality in university teaching and the experience has been exported to other universities such as Rome, Medellin, Montevideo and Lisbon as well as resulting a book "Walking the City: Barcelona as an urban experience"

RRI teaching and learning relevance

The programme is relevant to RRI teaching for several distinct reasons. Firstly the programme is designed to ensure the students receive inputs from various channels. An expert is assigned to each area the students explore on the city tour that presents specific knowledge to the students along with input from the communicative channels offered by the space and social environment. Therefore the students gain new knowledge both from the contents of the lecture and from their direct perception of place.

The programme also encourages and strengthens the relationship between the university and various social agents that are part of the tour such as architects, members of different social organisations and the local community. This allows the students to reflect on how the city evolves through both architects and urbanists thereby presenting a far more complex reality.

Finally the students are encouraged to develop an interdisciplinary overview of the urbanism and architecture of Barcelona, which goes beyond the physical limits of the classroom. They are taught to understand the city built environment, and the physical and social interactions that take place, thereby introducing them to the social system as well as the physical system of the City of Barcelona. The

students perceive the city critical eyes, dynamic explanations and on-site debates in order to discover the added value of urban environments that usually remain hidden.

Teaching format / pedagogical characteristics

The methodology to conduct the project concentrates on three innovative bases in the field of teaching urbanism. The first method is guided tours around diverse urban areas of Barcelona following an itinerary that connects a place with knowledge and has its own specific content presented by a local expert.

The second is the interpretation of urban experiences using graphic reports. During the walking tour the students utilize all their senses to observe the city, thereby acquiring in situ knowledge and commence a process of reflection through various graphic techniques. The information acquired on the walking tour is then transformed by the students into a graphic presentation in the form of drawings, paintings or images.

The third innovative base is the introduction of ICT systems, which allow debates on the virtual platforms created as an essential tool for the project. Every participant of Walking the City is connected through a number of communication channels such as a shared homepage. Through these channels knowledge is transferred between the participants thereby enriching the knowledge of each other and enhancing interdisciplinary skills.

Keywords

Social environment, urban experience, critical discussion, sustainability, mobility

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
X	X		

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
X							X

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
X			

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
		X	X

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Sources, links, further readings

General info: http://upcommons.upc.edu/handle/2117/88251?locale-attribute=en

Video (in Catalan, Barcelona City Council): https://www.youtube.com/watch?v=kLaG8RUtflg
http://www.bmiaa.com/walking-the-city-a-different-take-on-architecture-and-urban-planning-in-barcelona/

interview on the radio (in Catalan)
http://cadenaser.com/emisora/2015/04/27/radio_barcelona/1430146535_308512.html
http://eldigital.barcelona.cat/en/discovering-the-relationship-between-architecture-and-the-city_187357.html

https://issuu.com/heirriproject/docs/walking_the_city__social_interactio

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5.22   Database entry: "Recommendation for Promoting Research Integrity"

Recommendation for Promoting Research Integrity

Brief description

This policy document developed by the Irish Council for Bioethics in 2010 represents a summary of important decisions and suggestions about research integrity, supported by real world examples. The document describes several areas of research integrity, beginning with the description of research integrity concept, and then proceeding to list the core values emphasised by research integrity. Two approaches for greater integrity are described: promotional (educational) and deterrent, and these approaches can be applied differently in specific research fields. Also, several recommendations about the research integrity education are listed, such as proposal to start developing research integrity in younger students in a course format which has to be brief. Additionally, the authors list several necessary abilities which can be defined as outcomes of research integrity education.

RRI teaching and learning relevance

This policy document represents a pathway for course development. It gives specific instructions on how to design and conduct research integrity education through one or more courses. It represents a very important document in RRI domain, however, it is mainly a tool for teachers, and can possibly serve as a textbook for students when learning about research integrity. The following outcomes are recommended by Irish Council for Bioethics: ethical reasoning, ethical sensitivity, moral motivation and commitment and survival skills. These outcomes can be applied to all fields of science, especially those which emphasise social aspect in their research. It is recommended that students work in small groups rather than have big lectures where the activity of the students can be restricted. Finally, courses can be adapted to different formats (lectures, workshops or e-learning).

Teaching format / pedagogical characteristics

This tool contains general information on research integrity. The recommendations are supported by real-life examples. However, if the recommendations are applied, the learning results can be very diverse. The suggestions noted in the document are very flexible and can be applied as problem-based learning, as well as inquiry-based learning and as lectures. If the designed courses are short, e.g. workshops, it would be better to apply inquiry-based learning approach, while in full semester courses it is advised to start with more theoretical basis and then present students with real life cases and/or problem based learning. The application flexibility is the most important characteristics of this document. Also, with the flexible teaching format individuals from different scientific fields can easily

the best format for knowledge exchange.

Keywords
Research integrity/recommendations/learning/ethics/Irish Council

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
x	x	x	

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
x	x			x	x		

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
		x	x

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
x	x	x	x

Sources, links, further readings

http://health.gov.ie/wp-content/uploads/2014/07/Recommendations_for_Promoting1.pdf

5.23   Database entry: "Harvesting Results Preparing for the Future (Mobile Educational DNA Labs)"

Harvesting Results Preparing for the Future (Mobile Educational DNA Labs)

Brief description

This report written by the Centre for Society and Life Science in 2013 begins with a brief description of genomic science development from its origins until today. The description is focused on ELSI (Ethical, Legal and Social Implications) and ELSA (Ethical, Legal and Social Aspects) programmes which are funded by numerous international agencies. It is estimated that the 5% percent of the total project budget is spent on ELSA/ELSI and that this percentage is increasing over time. Furthermore, the description of the aims of the Centre for Society and Genomics reveals that they have incorporated RRI aspects in their definition, development and implementation. The authors also give an explicit definition of RRI and different RRI aspects in general. All statements are supported by exemplary cases in the field of genomics. One of the results of the programme (applied mostly in elementary schools in Netherlands) were mobile DNA labs, designed especially for educational purposes, where scientists communicate with students about the field of genomic science.

RRI teaching and learning relevance

This case is a very good example of a solution for interesting interactions with the lay public. It is an example of merging multiple interdisciplinary objectives and using both genomic knowledge and RRI to stimulate public engagement in both fields. It is possible to use the mobile DNA labs and/or DNA website as an example in lectures or workshops when starting a new student project, and it is also possible to create different mobile labs focusing on different fields like chemistry or biology in order to bring modern science closer to the public. This example could give students a nudge to learn in more divergent manner. RRI aspects that are taught are primary science literacy through education in genomic science and public engagement where scientists and lay people have a chance to interact and learn from each other. This can lead to interdisciplinary knowledge, critical knowledge and training in problem solving.

Teaching format / pedagogical characteristics

Use of real life cases where students have to recognize RRI elements applied in real life. As an example, it could be used as a part of a lecture in science literacy and/or public engagement classes, allowing students to give their own opinions about the quality and relevance of the examples. Furthermore, by using real life cases, one could emphasize where common mistakes are made and where research can

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be improved. It could also be used as a scenario in inquiry-based learning when describing the process of science literacy improvement among lay people. However, because the document describes a project which is implemented in a very specific field, its use in RRI teaching and learning may be limited and the quality of learning outcomes might be questionable. We advise exploring other examples which will address a wider range of different scientific fields, allowing different stakeholders to perceive the use of science in everyday life.

Keywords
Ethics/interdisciplinary/DNA/public/innovation

Relevant degree levels

Bachelor level	Master level	PhD level	Other, please specify
X	X	X	X (secondary school, MOOC)

Relation to 'RRI Keys'

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability
X	X			X	X		

Relation to 'RRI Tools' classification

Inspiring practice	Project	Tool	Library element
X			

Target audience / participants

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation
X	X	X	X

Sources, links, further readings

http://www.society-lifesciences.nl/

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6. Appendix A: Template for case description

Template for HEIRRI database entries

[For each of the 27 selected cases/examples/practices identified as relevant to HEIRRI, a separate template should be filled. Note that these selected entries have all been partially described during the preparatory work in the review process. Partial descriptions can be accessed in the XL file enclosed with the email. In order to arrive at fairly homogeneous entries (in terms of format), please aim to come close to the suggested word-target for each question below.]

Title/name of entry
[Note the name of the case/example/practice]

Brief description
[Please describe the case/example/practice in concrete terms. What is it about; how is it organised? Target: 150 words]

RRI teaching and learning relevance
[Why is this case/example/practice relevant for RRI teaching and learning; which kind of learning outcomes are present? E.g. interdisciplinary objectives, critical thinking, reflexivity etc. Target: 200 words]

Teaching format / pedagogical characteristics
[How can this case/example/practice be characterised in terms of its pedagogical aspects? E.g. PBL / IBL / PL, use of real-life cases etc. Target: 200 words]

Keywords
[Please note five keywords which you think capture this case/example/practice]

Relevant degree levels
[To which of the following degree levels in HE is case/example/practice relevant; several may apply]

Bachelor level	Master level	PhD level	Other, please specify
			[e.g. MOOC, life-long learning etc.]

Relation to 'RRI Keys'
[Please check those keys, if any, which are specifically being addressed in this case/example/practice; several/all may apply]

Citizen and CSO engagement	Science literacy and education	Gender equality	Open access	Ethics in R&I	R&I governance	Inclusion / social justice	Sustainability

Relation to 'RRI Tools' classification
[Please try to characterise this case/example/practice by checking one cell in the scheme below]

Inspiring practice	Project	Tool	Library element

Target audience / participants

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[For which of the following scientific areas is the case/example/practice relevant; several/all may apply]

Natural science and engineering	Biomedicine and health	Humanities and social science	Technology development and innovation

Sources, links, further readings

[Please provide sources, links, and/or further information on this case/example/practice