D2.1 Initial review of Responsible Research and Innovation aspects in Higher Education curricula in Europe: consultation and analysis of needs

Nicola Buckley, Public Engagement, University of Cambridge
with Valentina Tassone and Hansje Eppink, Education & Competence Studies, Wageningen University

February 2016

--- The RRI Competence Framework developed in this document should be seen as an early draft. The framework has been updated as EnRRICH Deliverable 2.3, also available at www.enrrich.eu. ---

Table of Contents

Introduction

The EnRRICH project, funded by the European Union's Horizon 2020 research and innovation programme, aims to support the embedding of Responsible Research and Innovation (RRI) in curricula. It works to develop the capacity, knowledge, skills and attitudes of students and staff in higher education to respond to the research needs of society. The project includes a focus on the co-creation of research with civil society organisations (CSOs) to help enable students to acquire the broad range of skills, knowledge and experience needed for a knowledge society to flourish.

The EnRRICH project was brought together by the Living Knowledge network, which builds partnerships for public access to research and includes numerous science shops among its members, which carry out research in a wide range of disciplines on behalf of citizens and civil society, often involving students as researchers. The 13 members of the EnRRICH consortium represent science shops and science shop-like structures in higher education institutions in Europe.

This report is a first survey of experiences, knowledge and attitudes among lecturers at European higher education institutions that are part of or linked to the EnRRICH project, with regard to RRI and involving CSOs in teaching and learning. Information has been gathered on how approaches like participatory research, research with and for civil society, community-based research and science shops can provide opportunities for students to learn about aspects of RRI.

The aim of this report is to identify needs among lecturers and directors of education at European universities with regard to developing more inclusion of aspects of RRI and working with CSOs in teaching and learning. It also includes some perspectives from CSOs and students for the inclusion of RRI in students' learning and research. The EnRRICH project plans to use information from this report to inform pilots of particular courses and course material addressing RRI and work with CSOs.

Identifying best practice, surveying needs and developing new course material in RRI

Defining RRI, RRI policy agendas and RRI competences

Responsible research and innovation has emerged as an important context for science, and in this context, higher education in society. It has been defined as 'a dynamic, iterative process by which all stakeholders involved in the research and innovation practice become mutually responsible and share responsibility regarding both the outcomes and process requirements' (Klaassen, Kupper et al. 2014).

For the EnRRICH project, the consortium needed to arrive at a definition of RRI that was particularly relevant for curriculum development for students including those at Bachelors and Masters levels who may not yet be part of the research process, but are in education and training.

The philosophical background to the proposed definition of RRI in higher education curricula has been elaborated as based on 'a *prospective* perspective: responsibility can be approached as *care* and *responsiveness*.' (Tassone and Eppink 2015). This goes beyond a consequentialist perspective, in which responsibility is mainly interpreted as accountabilit*y* or liability (Stilgoe, Owen et al. 2013).

The following initial definition has been developed of RRI in higher education curricula:
'Fostering RRI through higher education curricula is about inspiring and equipping learners to collectively care for the future by means of responsive stewardship of scientific and innovation practices and products that address the grand challenges of our time and that are ethically acceptable, sustainable and socially desirable.' (Tassone and Eppink 2015).

The EnRRICH project also takes the integration of RRI into the curriculum to bring a particular focus on collaboration between stakeholders and the co-production of knowledge.

This working definition particularly builds on the definition of responsible innovation arrived at by authors reviewing public debates on new areas of science and technology (Stilgoe, Owen et al. 2013). It is also in line with various definitions of RRI used, including that developed for the RRI Tools project (Klaassen, Kupper et al. 2014) and definitions used in European Commission policy documents ((von Schomberg 2011, von Schomberg 2013, Expert Group on Policy Indicators for Responsible Research and Innovation 2015). The conceptual underpinning for this working definition is elaborated in EnRRICH milestone 5 (task 2.1 report) but it is likely to be subject to revision during the EnRRICH project (Tassone and Eppink 2015).

The EnRRICH consortium took the following policy agendas to include:
- Public engagement (including engagement with civil society organisations)
- Science education (and outreach from higher education to school pupils)
- Open access
- Ethics
- Gender (and diversity more broadly)
- Governance of research and innovation
- Sustainability
- Social justice

These policy agendas go beyond the initial five or six (including governance) RRI keys originally identified by the European Commission. The question of sustainability was raised as important in the consortium launch for the EnRRICH project. Sustainability and social justice were included as among important indicators of RRI by the RRI Tools project in a recent report for the European Commission (Expert Group on Policy Indicators for Responsible Research and Innovation 2015). See the Appendix for a summary.

'Process requirements' have also been identified as important for RRI. The RRI Tools project proposes that these can be categorized as anticipation (envisioning the future and understanding how present dynamics of promising shape the future), reflexivity (which occurs as first-, second- and third-order learning), inclusion (the involvement of a wide range of stakeholders, such as users, NGOs, etc. in the early development of science and technology) and mutual responsiveness (responding to emerging knowledge, perspectives, views and norms). In addition, three further process dimensions appear in the RRI Tools project's conceptualization of RRI: diversity (key criterion for the evaluation of interactive policy-making processes), meaningful openness (rephrasing transparency) and adaptive change (describing how an RRI process must leave room to adaptation) (Kupper, Klaassen et al. 2015)

The EnRRICH consortium has taken the broad categories of anticipation, reflexivity, inclusiveness, responsiveness to relate to competences to be developed by students in higher education and has carried out preliminary work which develops these process requirements into a competency framework (Stilgoe, Owen et al. 2013, Tassone and Eppink 2015). Competences are understood as developed through an interplay of knowledge, skills, attitudes and values. The idea of competences has been used in the educational context to go beyond the idea of knowledge acquisition alone to bring in abilities, skills and attitudes, and the development of competences is a feature of the Dublin descriptors (Bologna Working Group 2005).

At the time of surveying lecturers, this initial drafting of an RRI competency framework was taking place in parallel, and the feedback provided by lecturers will help put concrete examples into the model, and develop / modify the framework. At the point of consultation, therefore, lecturers were asked about the broad concepts of anticipation, reflexivity, inclusion and responsiveness. They were asked whether

these related to competences or areas of knowledge, skills and attitudes that they aimed to foster through the courses they taught. Therefore lecturers' interpretation of competencies may differ because they were not presented with a general definition but rather asked to respond about how the meanings they related to the policy agendas and process requirements.

Details of the competences within anticipation, reflexivity, inclusiveness and responsiveness appear at Appendix 2, and the headings only are summarised in Figure 1 below.

Figure 1: Preliminary RRI competence framework

Future-oriented creative thinking
Future-oriented critical thinking
Future-oriented ethical engagement
Forecasting
Future-oriented inter-disciplinary thinking
Being pro-active and well-timed

ANTICIPATION

Context-awareness
Disruptive thinking
Ethical awareness
Cultivating virtues
Social moral disposition
Understanding complexity

REFLEXIVITY

RRI competence

RESPONSIVENESS

INCLUSIVENESS

Navigating Complexity or Wickedness
Ethical-inclusive design & practices
Flexible design & practices
Stewardship & Agency
Monitoring and Evaluation
Adaptability

Participatory ability
Perspective-taking ability
Nurturing diversity
Multi-perspective communication
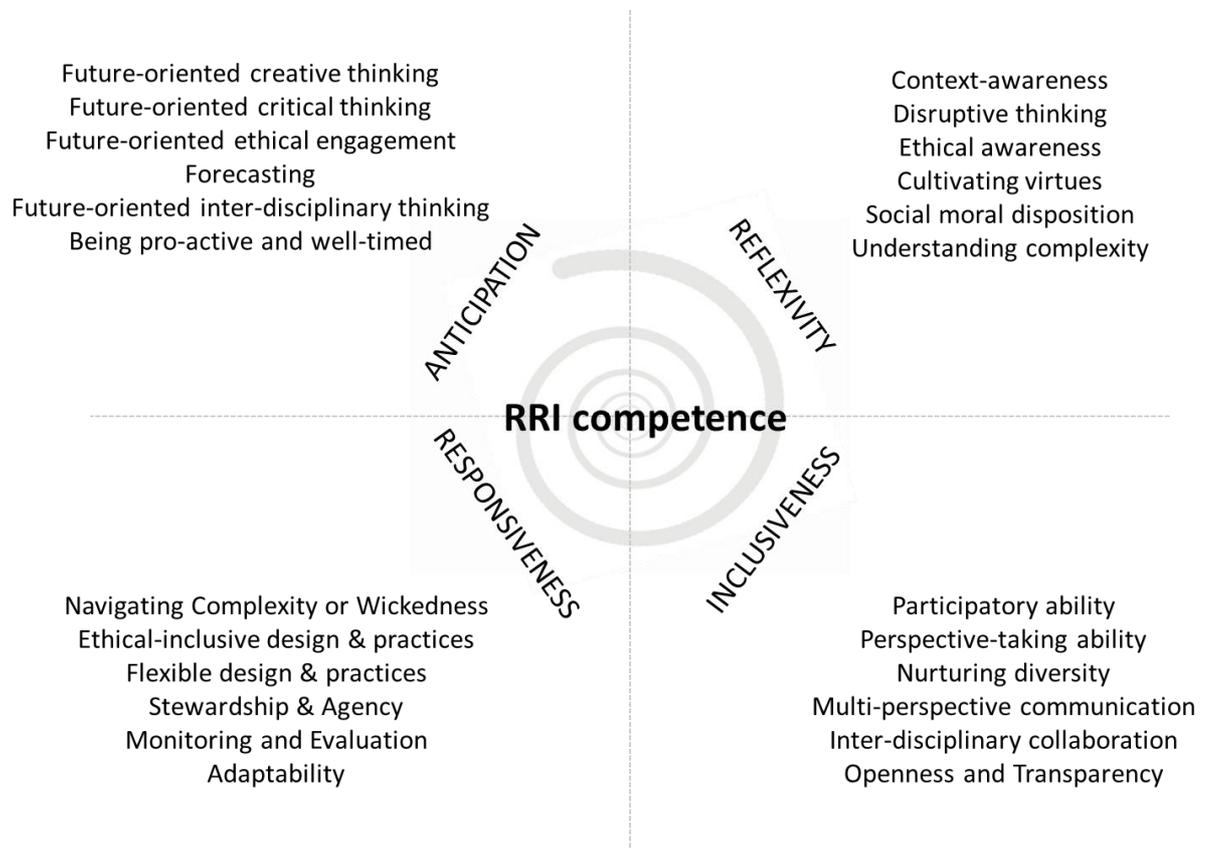Inter-disciplinary collaboration
Openness and Transparency

Figure: Tassone & Eppink (2015)

Method

EnRRICH members at 11 higher education institutions, one research institute and one civil society organisation in 10 countries in Europe consulted with lecturers and directors of education in higher education institutions about RRI in the curriculum.

31 lecturers from 11 institutions initially provided detailed information on how they currently address RRI elements in the courses they teach. They were identified by EnRRICH consortium members as potentially interested in RRI, but not yet necessarily specifically integrating the concepts within RRI in the courses they taught in higher education. Further to this, 27 lecturers were identified as already working with civil society organisations in helping students to learn with those organisations through science shop projects and other forms of community-based learning, and these lecturers provided 'promising practice' information to be made available via the EnRRICH website. Data from the lecturers were gathered through interviews and written responses to questionnaires.

EnRRICH consortium members consulted with lecturers at their own or partnering higher education institutions. An information sheet on RRI and the EnRRICH project was provided, and EnRRICH members translated the concepts within RRI, and discussed these with lecturers. Consortium members were also asked to gather feedback from CSOs and students on RRI as it relates to students' learning and research.

Feedback from audit, including potential needs and areas for development

RRI overall

EnRRICH members approached lecturers in a wide variety of disciplines, including engineering, business, bioscience, sociology, social work, history, architecture and more, to discuss RRI. They were all lecturers with whom EnRRICH members saw potential for discussing the concept of RRI and potentially developing future curriculum projects to involve civil society organisations in science shop projects or in other forms of community-based research and learning by students. No attempt was made to sample lecturers who might be resistant to concepts within RRI, as the EnRRICH project is an action project aiming to learn about and pilot more RRI-based interventions in curricula. The aim was therefore to ground the EnRRICH project in some current understanding of the field and suggest opportunities for development.

It took time by EnRRICH members to make relevant aspects of RRI for lecturers, CSOs and students. In different contexts and disciplines, RRI means different things to a variety of people. In consultation with academics, RRI was not typically found to be addressed explicitly in research let alone teaching. So part of

the goal of EnRRICH is to stimulate discussion of the potential relevance of RRI to teaching and learning.

The lecturers consulted were generally receptive to the RRI concept overall and could see how elements of the concept related to their own research when they carried that out, as well as to students' learning. As a fairly new policy framework within the area of science and society from the European Commission, most of the lecturers described ways in which a number of the RRI keys were addressed through their courses, and how some or all of the process requirements mapped on to competences and knowledge that they aimed to develop among students. Most of those interviewed were not using the RRI framework but they gave feedback on what they thought was useful for teaching and learning in their subject from the RRI information provided to them by members of the EnRRICH consortium.

Several lecturers commented on the broad scope of RRI:

'I think the concept means to merge different areas into a whole, and to implement it as a whole will always be difficult. Especially, because there are different areas of responsibility at higher education institutions for topics such as governance, gender, public engagement or sustainability in general. Such an RRI concept can probably be realized, if all those who originate from these heterogenous backgrounds find a cooperation mode which leads to coverage of all the RRI elements. Of course I am convinced that all hidden behind the concept – social justice, to integrate ethical reflection into teaching or new forms of governance – is essential at universities.   '
Lecturer, Leuphana University of Lüneburg

'RRI should be the aim of science in general: if a new approach is needed, then we – obviously – do not have it at the moment'
Senior University leader, University of Vechta

'The meaning of the discipline for society' should be a course in every Masters discipline, including an overview of the most recent research studies, how they are applied in society etc.'
Lecturer, Sociology and History, Vrije Universiteit Brussel

A number of lecturers saw the idea of RRI as having substantial crossover with the concept of sustainability. Others also saw a number of aspects of RRI being addressed in the curriculum through consideration of ethics, and encouraging students to see their studies in broader social context.

Interface with other policies

One of the opportunities for embedding RRI in the curriculum will be the interface with other policies with regard to higher education. Within the framework of the Bologna Process and Dublin descriptors as they apply to higher education,

there is the opportunity to relate elements of RRI teaching and learning. For example, students completing the first cycle (typically a Bachelor's degree) are expected to demonstrate 'ability to gather and interpret data to inform judgements that include reflection on relevant social, scientific or ethical issues'. This domain is developed at second cycle / Masters level to include 'reflecting on social and ethical responsibilities linked to the application of their knowledge and judgements'. At third level / Doctoral study, students are expected to become 'capable of critical analysis, evaluation and synthesis of new and complex ideas' (Bologna Working Group 2005: 67-9). It will be part of the EnRRICH project's forthcoming work to see which Dublin descriptors may map on to aspects of the RRI competency framework we propose.

There are also quality frameworks for disciplines in higher education and professional accreditation requirements for courses leading to professional qualifications, and lecturers in this consultation referred to this, for example:

> *'Most of the RRI keys are already covered by our quality requirements [professional accreditation in social work or teaching]'*
> *Lecturer, Social Work, University of Vechta*

Examples were also shared from disciplines such as engineering and business studies where elements of RRI can help meet professional requirements for those subjects.

Competences

A number of lecturers mentioned the idea of competences in the learning outcomes for the courses they taught. Competences include both knowledge and skills that students develop through courses they take. The idea of competences to be developed in higher education is also a feature of the Dublin descriptors in higher education. RRI is a concept in order for which students to become more familiar will involve them in developing competences: knowledge, skills and reflection on attitudes and values in society.

RRI addressed in courses (without CSO involvement)

Keys

In asking lecturers how they may integrate RRI keys or policy agendas in teaching and learning at present, the aim was also discover where they may be indications of particular needs that the EnRRICH project can aim to make pilot interventions to meet. The consultation was with lecturers who were identified as having some potential or existing interest in RRI. Information was gathered both on courses with the involvement of CSOs, and those without, but where there might be

some potential, as that is the area of work that the EnRRICH project will then develop.

Of the keys or policy agendas, there were a number of dimensions that lecturers thought could be integrated in teaching without necessarily being most effectively explored through CSO involvement – for instance, **gender** questions were often integrated into existing teaching and learning programmes and might also be a feature of group project work.

> *'Gender is a very important matter. We have specific offers (i.e. modules), but we also have embedded the gender topic in modules . . . gender is a cross-sectional topic'*
> *Senior University leader, University of Vechta*

A number of lecturers thought it was important to expose students to questions of **open access** publishing, and sharing their learning in such a way that it was accessible to wider audiences. Open access is increasingly covered at Masters and doctoral level and might be a feature of science communication programmes offered to doctoral students for example.

> *'Open access is tackled when talking about the scientific publication system'*
> *Lecturer, Cellular Biology, University of Barcelona*

Many lecturers teach research **ethics**, but there are particular programmes on ethics more broadly integrated into particular courses. Ethical teaching and learning was integrated into a diverse range of subjects from social work to engineering and business.

> *The kind of teaching that the Centre conducts helps to develop students' understandings of complexity and ambiguity – looking at questions such as how value can be socially constructed.*
> *Lecturer, Social Innovation, University of Cambridge*

The policy agenda **science education** needs explaining in its meaning of outreach to the next generation. In that sense, some lecturers did integrate some learning for students in this sphere such as students preparing outreach sessions for high school students as part of the curriculum.

> *'Students on the Civil Engineering study programme took part in a competition, 'Pasta Bridges' organized as part of a Science Discovery Day'*
> *Lecturer, Civil Engineering, Vilnius College of Technologies and Design*

 Public engagement was integrated in the curriculum without specific involvement of CSOs in some cases, and this tended to be through students thinking about how to share their work with wider audiences through science communication

and other methods. Examples were also shared of general introductions to RRI that promoted subsequent engagement:

> *'with societal actors in planning, designing and carrying out actual research projects'*
> *Lecturer, Translational Medicine, University of Barcelona*

As for **sustainability**, as a concept with a longer history than RRI, a number of lecturers had already integrated this into programmes in engineering, architecture and business for example.

> *'Through analysis of engine emissions, environmental pollution and its effect on human safety is predicted. Real societal needs are assessed. Students get engaged in experimental research and projects aimed at reduction of fuel consumption and environmental pollution'*
>
> *Lecturer, Engineering, Vilnius College of Technologies and Design*

Social justice tended to be mentioned more often by lecturers in social sciences and humanities than in science and engineering, so there may be particular opportunities for EnRRICH in helping to devise educational materials that address social justice aspects of science and engineering.

> *'One of the main objectives of the Masters is that students change their perception of the world, and start wondering for what kind of society they want to work, hence ethics and social justice are topics that are debated in class'*
>
> *Lecturer, Global Health & Clinical Research, Faculty of Barcelona*

The **governance** of research and innovation is a large and over-arching topic and was mentioned by few lecturers as specifically integrated in the curriculum. As a systematic issue in RRI, it was considered by EnRRICH members asking questions to be quite hard to integrate into the curriculum although the governance of individual research projects with CSOs was of more relevance (see below).

Process requirements

As is noted in the development work towards a competency framework for RRI for EnRRICH, the following competences and dimensions suggested for RRI are interlinked and overlap.

Several of the lecturers considered **reflexivity** to be an ability that students were encouraged to develop through particular courses they taught, for instance 'consideration of the students' research topic in broader context' (Lecturer and coordinator of doctoral programmes, Vrije Universiteit Brussel).

A number of lecturers involved in interdisciplinary education discussed the role of interdisciplinarity in fostering students' reflexivity:

> '*By attending the lectures, participating in debates and reflecting with fellow students from various disciplines, students learn how to recognize and respect different positions and arguments in scientific discussions*'
> *Lecturer, Interdisciplinary Course, Vrije Universiteit Brussel*

Lecturers in the social sciences saw reflexivity as particularly important, as well as lecturers involved in educating students for professional fields such as social work or education.

Anticipation was a competence mentioned by lecturers in some fields of business and management in particular, by way of teaching that encouraged students to foresee the varied implications of developments in innovation and business.

> '*A topic that often comes up concerns the unintended consequences of action in enterprise: for example how moving from one form of production using child labour can open up other problems*'
> *Lecturer, Social Innovation, University of Cambridge*

Inclusion and inclusiveness overlaps with reflexivity in particular, with students' perspective-taking ability and critical thinking coming into interaction with the ability to collaborate with others and nurture diversity. This was mentioned as an aim of group work in particular among lecturers. Some introductory courses on RRI are being developed and there can be group work to discuss and integrate perspectives on RRI.

> '*Students reflect and share their views on the needs and constraints of putting RRI into practice through a workshop using green and red cards using a World Café methodology . . . in groups students analyse and discuss questions relating to RRI quality criteria such as diversity and inclusion . . . afterwards one representative of each group presents their conclusions to the rest of the class*'
> *Lecturer, Translational Medicine, University of Barcelona*

Responsiveness in higher education may be harder to identify without specific work with external partners. Competences for responsiveness can include being able to design work in a way that considers ethics and the needs of a variety of stakeholders. One lecturer pointed to the 'social entrepreneurship networking platform' that the business school he teaches within supports for students, considering that RRI learning among students can be fostered through that and thought that:

'. . . this may have more concrete and societally relevant effects than student research with maybe no result at the end'
Lecturer, Business, Vrije Universiteit Brussel

RRI addressed in courses (with CSO and/or science shop involvement)

Keys

Of the RRI keys or policy agendas, **public engagement** was the one most often mentioned as particularly addressed through CSO and/or science shop involvement. Students could become involved in consideration of the benefits and challenges involved in public engagement with research by reflecting on the knowledge needs of CSOs. While there were opportunities to work on contemporary issues and have the active involvement of CSOs in co-designing Masters projects, there could also be challenges for students. For instance:

'CSOs tend to think research projects will produce a final action . . . research does not necessarily lead to concrete actions or recommendations to be implemented'
Lecturer, Global Health, University of Barcelona

In this kind of way, students learned about the challenges in doing research with and for CSOs and reflected on what the issues were in how knowledge is acquired and applied in society.

There were also some examples of **open access** being specifically addressed by lecturers and students through collaboration with civil society in teaching and learning. For example, an oral history module carried out in Queen's University Belfast involves the students, lecturers and civil society partners considering together how to share data from interviews carried out, doing research ethically and taking appropriate data protection into consideration in publishing work online.

There are a few examples of how **gender** (and diversity) topics have been specifically integrated with the involvement of a CSO. For example, a gender and equality half-day has been built into a Bachelors course in Materials Science and Engineering at the Institut National des Sciences Appliqués de Lyon in France. A local CSO promoting the contribution of women to the economy and society contributes to the teaching of this course and real cases are presented to students.

Reflection on **ethics** is necessarily integrated for students in learning or researching with CSOs as with other external organisations. For example, there is a thorough integration of CSOs and public sector organisations in the Masters programmes in Social Policies and Social Work at the University of Sardinia. A two-day seminar was organised with a local CSO on 'ethics in public administration' and students learn to integrate theory with practice with regard to the social workers' code of ethics while on placements.

As a policy agenda for RRI, in this context **science education** relates to outreach from higher education to equip young people in schools in particular to gain knowledge and skills that may equip them to be future researchers, innovators and citizens in society. This aspect of RRI was sometimes a feature of students' extra-curricular experience at universities, but it can be integrated in some courses where external partner organisations such as schools took part. This is clearly an area where students of Education can make a particular contribution. There was an example from an Education programme to train biology teachers, where school leaders and teachers can approach the lecturers with ideas for Bachelors or Masters theses about innovations in teaching.

Sustainability is explicitly addressed by some courses in universities that have CSO involvement. For instance, a course in 'Empowerment for Sustainability' supports students developing their own agency in contributing to a sustainable world.

> *'Students identify a personal issue problem in their community / society and develop an innovative project to tackle this issue / problem by creating a collective engagement within society . . . students can work with CSOs, shops, schools, businesses'*
> *Lecturer, Education and Competence Studies, Wageningen University*

Social justice in the context of RRI has been outlined as 'creating conditions in which actors have equal rights, equal opportunities and equal access from either participation in research and/or access to benefits arising from it.' It is an explicit focus in courses such as education and social work where cooperation with CSOs and schools may be integrated. Courses where students blended both practical experience of working with external organisations with critical reflection and teaching in higher education are seen as equipping students with competences to contribute to positive social change:

> *'I want students to learn about principles and practices needed to understanding of processes and to pursue positive social change. Critical understanding without method is abstract and method without critical understanding is blind.'*
> *Lecturer, Social Policy and Social Work, University of Sassari*

There were also some examples from engineering courses where social inclusion in research, innovation and the application of knowledge were addressed with CSO involvement. In a course on the 'social responsibility of the engineer', Bachelors students look at a real scientific challenge with a societal dimension: for instance the aftermath of an earthquake in a developing country. The rescue of people and the transport of injured people as well as provision of utiltities were

subjects tackled. A guest lecturer from a CSO with experience in the field contributed and:

> *'came to make students aware that cultural, geographical and climate aspects for example had to be taken into account to help victims in emergency situations (and by extension, to act more responsibly and more efficiently)'*
> *Lecturer, Engineering, INSA de Lyon*

Process requirements

Working with CSOs and external organisations can give students a particular opportunity to learn about the involvement of a variety of actors in research and innovation.

Responsiveness is a process dimension often mentioned by lecturers as a particular feature of involving CSOs with students' learning, through visits, guest lecturers and co-created student research projects. This process dimension may be harder to build into to the student curriculum without some involvement mechanisms for CSOs than the other three, and so is a particular dimension that science shops and similar structures can bring to students' learning.

Inclusiveness also features in accounts of how students learn with CSOs: competences in inclusiveness may be seen to include participatory ability, the ability to nurture diversity, to participate in multi-perspective communication and to build partnerships. By developing these kinds of competences, research is seen in the round and students do research with and for CSOs and not just on them.

Reflexivity is a process dimension that a number of lecturers saw as possible to develop among students without the specific involvement of CSOs in courses, but it was also mentioned by lecturers who had experience of working with CSOs. For example, students of business and management might be encouraged to develop greater self-awareness with regard to their career goals at the point of transition into employment. Students reflect and develop awareness about assumptions and values, that influence their experience of higher education and research. At one business school, students interviewed professionals including those working for CSOs to understand better both external pressures on career choice and potentially how to draw upon:

> *'certain fundamental values (credibility, authenticity, ethics, awareness, autonomy) and the drive to become a professional characterized by these values'*
> *Lecturer, Management, Corvinus University of Budapest*

Anticipation in this context refers to developing competences in collectively imagining ethical, sustainable and socially desirable futures and anticipating concerns and implications related to research. This was a process dimension

explicitly mentioned by lecturers leading courses where external organisations including CSOs were involved in setting research projects for students. For instance, in an Academic Consultancy Training course, students worked for 8 weeks on projects initiated by external organisations and in their final reports they need to consider:

> *'the future orientation of the project and anticipate possible challenges. However they may not be asked to include in this future perspective the sustainability issues of society at large'*
>
> *Lecturer, Academic Consultancy Training, Wageningen University*

Assessment

A variety of methods of assessment were used in the integration of RRI elements so far in courses: from certificating attendance only to production of group work, oral presentations, dissertations, reflexive reports, exams and more. More specific information appears with each 'Promising Practice' about how learning on that course is assessed, on the EnRRICH website Work Package 2 webpage.

Needs and opportunities

When lecturers were asked about the potential supporting and hindering factors for greater embedding of RRI and potentially CSO involvement in the curriculum, some of the following needs and opportunities emerged.

Universities working with CSOs

Lecturers, CSOs and students identified some of the factors that promote the inclusion of CSOs in students' learning and research.

<u>Supporting factors</u>

The benefits of involving CSOs as well as other external organisations in students' learning were identified by a number of lecturers, in helping students identify how research can make a contribution to social issues:

> *'Students can work with CSOs, shops, schools, businesses. The students themselves are identifying individually an issue / problem they would like to tackle in society / their community. The students are not merely executing someone else's idea, but they are creating their own ideas. After identifying their issue / problem they would like to tackle they need to develop / design an innovation project fitting the societal context'*
>
> *Lecturer, Education, Wageningen University*

Students were identified as often having interests in future work for CSOs as well as how they could make a contribution to society more broadly, and these were seen as motivating factors in working with CSOs in the curriculum.

<u>Hindering factors</u>

A number of lecturers with greater or lesser degrees of experience in working with CSOs referred to the time and commitments involved. This suggests the need/opportunity for brokerage services in universities such as science shops that can help support this work and maintain relationships with CSOs over time:

> *'once we would integrate a cooperation with CSOs for example, we are obliged to do it every year without knowing in advance if we have the budget for it'*
> *Lecturer, Business, Vrije Universiteit Brussel*

Time

<u>Hindering factors</u>

There is always limited time on each course to integrate all the requirements for students to learn, and lecturers also need to balance their time with a variety of competing demands:

> *'The Bachelor study programmes offer just a limited potential because it is limited by time. There is only a limited amount of credit points that can be filled within the study programmes.'*
> *Senior University leader, University of Vechta*

This suggests that the EnRRICH project could usefully develop a range of suggested approaches to teaching and learning and potential for involving CSOs that could be addressed with varying amounts of time in courses. For instance, developing introductions to RRI that could then be pursued further through project and course work.

Co-creation challenges

<u>Supporting factors</u>

Lecturers and CSOs identified a number of possibilities for students to learn about the complexity of knowledge generation and application in real world situations:

> *'The participation of Civil Society organisations happens in different moments in the course, but are especially relevant in some of the elective subjects and*

some of the Master's degree final projects . . . The Masters degree aims not only to teach a set of contents but also to develop students' skills, such as critical thinking, interaction with other stakeholders, problem solving etc. These skills are required in the new knowledge-based society, in which knowledge is becoming more complex, ambiguous and uncertain.'
Lecturer, Global Health and Clinical Research,
Faculty of Barcelona

Some promising practices were identified where students were introduced to community-based participatory research during their postgraduate studies with the aim of building capacity for more of these types of co-created research further on. There was realism about the challenges involved, with one course in this area having as an aim to:

'Identify common challenges faced by University/student(s) and civil society organisation partnerships, and strategies and resources for overcoming them.'
Lecturer, Social Work, University College Cork

Hindering factors

A number of lecturers were cautious and realistic about whether the specific courses they taught on would match with research requests from CSO. For instance it was suggested that a hindering factor in working further to seek student research ideas from CSOs could be:

'Lack/inactivity of research potential, differences in and specifics of fields of interest'
Lecturer, History of Architecture, Vilnius College of Technologies and Design

This suggests that the EnRRICH project, science shops and similar structures need to be responsive to lecturers' and students' needs in particular courses and see what potential there is to seek potential CSO input. This points to the importance of science shop coordinators and providers of brokerage services between universities and CSOs having a good understanding of course content, and seeking to be adaptable in finding ways to integrate consideration of societal challenges.

Relationship between academic culture and RRI

Supporting factors

A number of lecturers highlighted the ways in which elements of RRI were already addressed in the curriculum and the practice of their own discipline. So although RRI overall brings together concepts that were not necessarily previously linked, and there are always constraints on time, there was some willingness to engage with the concept:

'With the RRI concept, there is "something" additional coming, which needs to be integrated. There is already such a tight corset. So the freedom of teaching is barely there . . . But the good news is, many of the elements are already integrated. But one could not say that this is the module 'X' where it is taking place now. Some issues are explicitly present, the other more implicit than sectional'

Lecturer, Social Work, University of Vechta

<u>Hindering factors</u>

Lecturers also reflected on systems that mitigated against their own research being shared more broadly, for example:

'When it comes to the evaluation of performance, nobody is interested in publications in practical journals'
Lecturer, Education/ Biology, University of Osnabrück

These limitations informed the approach to teaching and learning too, with students at Masters and doctoral level perhaps increasingly perceiving the gaps between the production of academic knowledge and its effective sharing in society more widely.

Students' perspectives

'Interest from students' was mentioned by a number of lecturers as a <u>supportive factor</u> in embedding RRI in curricula and some students were also interviewed about their experience of collaborating with CSOs on research or other exposure to RRI. Examples of student motivation in this area were given by lecturers teaching on science communication modules and in business, for example:

'Students on the MBA wrote a paper for the head of the Business School asking that governance and ethics feature in all modules and not just in a separate one'.

Lecturer, Social Innovation, University of Cambridge

Experience from universities with science shops or other structures for engaging CSOs with student research indicates that this type of work is motivating for students:

'it is nice to conduct research that is actually useful'
Student, Education, Vrije Universiteit Brussel

Students with experience of doing research based on questions from CSOs reflected on what they had learned from the process:

> *'it was kind of a quick learning curve . . . I think the most important thing is the basic attitude and approach of humility and openness on the part of the researcher and treating your interviewee as a human being first and a participant second.'*
> *Student, Sociology, University of Cambridge*

Students were also realistic about the challenges of this kind of work:

> *'I think it helped us realise just how difficult research is within the real world.'*
> *Student, Business, Queen's University Belfast*

Students also express their willingness to learn about the interests of not-for-profit organisations as well as the commercial sector, as they are conscious that:

> *'businesses can have more leverage and a bigger voice than non-profit organisations'*
> *Student, Education, Vrije Universiteit Brussel*

Several lecturers also mentioned students' interests in the core requirements for assessment, however, and dimensions of learning that would not be examined or assessed would sometimes not be taken as seriously by students who are very focused on passing exams or gaining good grades through assessment.

Student involvement will be developed further through the EnRRICH project, as the process of gathering student feedback is a regular part of the work of the science shops and similar structures represented in the consortium. Further feedback from students on the RRI concept will be gathered through the pilots, and through lecturers who have indicated their interest in the topic.

CSO needs and opportunities

EnRRICH members (universities, research institute and a CSO) need to make sure that their fact-finding and pilots about RRI in the curriculum are grounded in knowledge of CSO needs. This is carried out through consultation at a local level by members with the CSOs who submit ideas for student research to the universities. EnRRICH members had mixed experiences with introducing the concept of RRI in discussion with CSOs. General consultation via email or group meetings were proved to be unproductive in some cases, and the concept was found to make most sense in one-to-one discussion, making sense of RRI for that particular CSO together. For EnRRICH pilots, it is important to co-develop their RRI aspects with CSOs.

As well as individual consultation with some CSO partners of the institutions who are members of EnRRICH, further evidence of CSO perspectives on RRI were sought through gathering feedback through events and documentation of the RRI Tools project, including stakeholder workshops held by national hubs.

Some CSOs were very interested in the idea of RRI:

'Of course we're a fan of RRI. I remember from being a student that it's ten times more interesting to research a societally relevant subject that is close to your own domains of interest that is at the same time useful for a CSO . . . At present researchers are a bit too far from our daily work, we need more interfaces'
Representative, youth work organisation, Belgium

Other CSOs saw some potential for involvement in RRI but raised questions about it:

I can see how we would fit into the RRI processes – we're inclusive and diverse – but I don't really think of the small projects we do with the students as research and innovation – but maybe we should, this could be another way to look at our work.
Representative, CSO, Ireland

When the time is taken to go through the dimensions of RRI with CSOs working with higher education institutions, and on student learning, it seems to offer the potential for learning on all sides:

It's a useful framework, it names things that would be in the back of our minds [in community-based research projects]
Representative, CSO, Ireland

CSOs are open to working with higher education institutions but they recognise that lecturers and students have to produce academic work which may not always be immediately applicable to them:

'We haven't found it easy to work with universities but we know there must be good opportunities to do more'
Representative, CSO, UK

This points to the need for brokerage services at universities to find ways to link learning and research to civil society organisations as well as the business and public sector links that exist. CSOs were able to see the big picture that RRI relates to, and to indicate their special role in helping students learn about how knowledge and innovation can tackle problems in society:

'There is a tendency to face increasingly bigger societal challenges and push innovation forward as the solution. But on the other hand we are dealing with short term funding and projects. This contradiction is very frustrating. Innovations should be checked in a critical way and require an innovative, suitable policy. Unfortunately the projects are splitted up and they don't come together enough. The challenge is to initiate a broader system of transition.'
CSO response, RRI workshop, Belgium

CSOs also reflected on their role in linking to the end users of research and the way in which their relationships linked them to processes that are important for RRI:

We are dealing with a critical public, tax payer/donor as driver for transparency. And in order to be transparent, you have to reflect on yourself.
CSO response, RRI workshop, Belgium

EnRRICH consortium members have experience of bringing CSOs and universities together to foster learning on all sides, and the new frame of RRI is one which needs to be further discussed with CSOs to develop their involvement.

Summary of key findings from consultation

- This information gathering exercise shows that there are courses which already address some aspects of RRI, often not articulated as RRI or with some elements present tacitly. Lecturers can be identified who already address a number of aspects of RRI in teaching and learning, and who are interested in incorporating further aspects
- Some lecturers see good potential for (further) involving students in co-creating research with CSOs or other forms of community-based learning as a way of learning about aspects of RRI
- Not all courses or modules can incorporate students doing community-based research or science shop projects if there is insufficient time for students or the lecturer, or CSOs do not tend to come forward with questions that suit the content of the course
- There are many ways to develop students' competences in RRI and various good practices have been written up to be shared on the EnRRICH website
- There are a number of policy and quality frameworks that lecturers already work within, which overlap in some areas with RRI
- Students have been found to value doing research on real world problems and research with and for CSOs can be a way for students to explore values and the use of research in society
- CSOs may become interested in RRI but it is not a framework that has been explicitly promoted to them to the extent that it has been to universities and research institutes at present. The framework does open up possibilities for discussion with CSO partners with universities about further ways to get involved with students' learning
- Extra- or co-curricular opportunities for students can complement the curriculum-based interventions in RRI – for example in science education and outreach, science communication training and support for students' social enterprise ventures

Recommendations

- EnRRICH should develop material for introductions to RRI which can be tailored for particular subjects
- The RRI concept could become more explicit in higher education courses with input from the EnRRICH project among others
- Particular pilot projects to involve CSOs in more courses at universities to help students develop RRI competences should be taken forward (as in the EnRRICH work package 3 description)
- The EnRRICH RRI competences framework should continue to be developed and related to key European policies for higher education including the Dublin descriptors and Bologna process. In particular, consultation with lecturers and the EnRRICH pilots will increasingly enable an understanding of how these competences can be addressed at different levels of higher education (Bachelors, Masters, Doctoral study).

References

Bologna Working Group (2005). A Framework for Qualifications for the European Higher Education Area. Copenhagen Danish Ministry of Science, Technology and Innovation.

Expert Group on Policy Indicators for Responsible Research and Innovation (2015). Indicators for promoting and monitoring Responsible Research and Innovation, European Commission.

Klaassen, P., et al. (2014). Policy brief on the state of the art in RRI and a working definition of RRI. RRI Tools project D1.1.

Kupper, F., et al. (2015). A catalogue of good RRI practices. RRI Tools project D1.4.

Smallman, M., Lomme, K., Faullimmel, N. (2015). Report on the analysis of opportunities, obstacles and needs of the stakeholder groups in RRI practices in Europe. RRI Tools project D2.2.

Stilgoe, J., et al. (2013). "Developing a framework for responsible innovation." Research Policy **42**: 1568-1580.

Tassone, V. and H. Eppink (2015). Enhancing Responsible Research and Innovation through Curricula in Higher Education - EnRRICH project WP2, task 1

von Schomberg, R. (2011). Prospects for Technology Assessment in a framework of responsible research and innovation. Technikfolgen abschätzen lehren: Bildungspotenziale transdisziplinärer Methode. M. Dusseldorp and R. Beecroft. Wiesbaden, Springer VS.

von Schomberg, R. (2013). A vision of responsible innovation. Responsible Innovation: Managing the responsible emergence of science and innovation in society. R. Owen, J. Bessant and M. Heintz. London, John Wiley**:** 51-74.

Appendix 1: RRI Keys

Textbox: The RRI keys (Expert Group on Policy Indicators for RRI, European Commission 2015)

1. **Governance**
   RRI is characterised by collaborative efforts of a variety of stakeholders who each have a particular interest in this process. Governance from such a network perspective is the manner to govern RRI dynamic and interactive processes. This key is also seen as an umbrella dimension for the following RRI keys.
2. **Public engagement**
   Public engagement focuses on encouraging and empowering citizens to participate to RRI, and stimulating dialogues among researchers, innovators, citizens and other stakeholders in order to foster mutual learning and collaborative decision-making.
3. **Gender equality**
   Gender equality focuses on equal participation of men and women in research and innovation activities and the inclusion and integration of gender perspectives in RRI content development.
4. **Science education**
   This key is related to the Public engagement key in that it aims to 'boost the interest' in science among children and young people, to contribute to a science-literate society and to better equip future researchers and other societal actors with the necessary knowledge and tools to fully participate and take responsibility in the research and innovation process.
5. **Open access/open science**
   Open access/open science focuses on transparency and accessibility of research and innovation practices and outputs in the attempt to boost innovation, to increase collaboration among actors and the use of scientific findings by society. Open access is not an end in itself, but a means towards RRI.
6. **Ethics**
   Ethics focuses on including shared values, fundamental rights and ethical standards within research and innovation efforts in order to increase societal relevance and acceptability of research and innovation outcomes.
7. **Sustainability**
   The other seven keys explained here are contributing in one way or another to aspects of sustainability, but these keys are not triggering the question to what extend the RRI practice contribute to sustainability? Sustainability focuses on achieving smart, sustainable and inclusive development and includes five target areas: employment, research and development, climate and energy, social inclusion and poverty reduction.
8. **Social justice/inclusion**
   Social justice/inclusion focuses on creating conditions upon which actors have equal rights, equal opportunities and equal access from either participation in research and/or access to benefits arising from it.

Appendix 2: Short description of preliminary set of competences

These are divided by dimensions and are proposed to constitute competence in RRI according to the preliminary framework

Dimension 1. Anticipation: it includes competencies in collectively imaging plausible, ethical, sustainable and socially desirable futures, in anticipating societal challenges and implications related to scientific and innovation practices

Competencies:
- **Future-oriented creative thinking:** imagining plausible, sustainable and socially desirable futures we want science and innovation to bring into the world
- **Future-oriented critical thinking:** engaging with inquisitive questions in relation to possible futures (e.g. the "what if" questions), to possible hampering factors for anticipating and realizing possible futures (e.g. institutional and cultural resistance to anticipation) and to possible consequences of those futures
- **Future-oriented ethical engagement:** cultivating future-oriented ethical culture (e.g. a sense of care towards the future) and engaging with questions related to the goodness of those futures (e.g. the "to what end" questions)
- **Forecasting:** assessing through tools and methodologies possible future implications and impacts, in the short-term, mid-term and long term, of current and future scientific and innovation practices
- **Future-oriented inter-disciplinary thinking:** applying integrative and inter-disciplinary lenses and tools when exploring the implications and impacts of current and future scientific practices and innovation
- **Being pro-active and well-timed:** being pro-active and well-timed when engaging into anticipatory processes and practices, early enough to be constructive but late enough to be meaningful

Dimension 2. Reflexivity: it includes competencies in reflecting, understanding and cultivating awareness about context, assumptions, commitments, values, in relation to societal challenges and to the work of science and innovation at the levels of actors, institutions and society.

Competencies:
- **Context-awareness:** having awareness about the social, economic, ecological, cultural, political, etc. context characterizing a certain issues, a societal challenge, a research and innovation endeavour
- **Disruptive thinking:** questioning own and others' worldviews, assumptions, participation and practices, and engaging with unconventional ways of thinking

- **Ethical awareness:** having awareness about the type and application of ethical resources like for example adoptions of codes of conducts and standards but also upon purposes, commitments and social values relevant within scientific and innovation practices
- **Cultivating virtues:** having awareness and cultivating own values and virtues underlying the search for the common good (for human and non-human)
- **Social moral disposition:** having awareness about one's role responsibilities and about wider social moral responsibilities and in knowing how to blur the boundaries between the two
- **Understanding complexity**: understanding the complexity and inter-disciplinary character of many societal challenges and responsible research and innovation endeavours

Dimension 3. Inclusiveness: it includes competencies in including, communicating with, collaborating with, questioning and bridging voices of diverse stakeholders and the wider public within scientific and innovation practices.

Competencies:
- **Participatory ability:** applying participatory methods and tools for engaging into discussion, at various moments, diverse stakeholders and the wider public, including minorities and silent voices
- **Perspective-taking ability:** understanding that there can be different perspectives and worldviews to be taken when approaching science and innovation practices and when addressing an issue, and that a particular framing may not be universally held
- **Nurturing diversity**: welcoming and attempting to reconcile diverse and divergent viewpoints
- **Multi-perspective communication:** communicating with the wider public and diverse stakeholders by being sensitive to different perspectives, by listening to and by challenging entrenched assumptions, perspectives and ways of doing things, by giving and receiving feedback
- **Inter-disciplinary collaboration**: including and bridging different disciplinary perspectives
- **Openness and Transparency**: sharing information, through appropriate means and tools, regarding process of deliberation, decision making, findings and practices including also uncertainties and limitation, while being mindful about restrictions (e.g. intellectual property rights, need to limit the circulation of sensitive data)

Dimension 4. Responsiveness: it includes competencies in coping with and responding to emerging challenges and to new knowledge, perspectives, public values, and norms through scientific and innovation endeavours

Competencies:
- **Navigating Complexity or Wickedness**: overcoming any sense of paralysis and navigating the complex or wicked nature (characterized often by

controversy, indeterminacy and uncertainty) of emerging societal challenges and research and innovation practices

- **Ethical-inclusive design & practices**: including ethical aspects, social values and virtues, within scientific and innovation design, choices and practices
- **Flexible design & practices:** applying tools and processes allowing flexibility within scientific and innovation design and practices in order to accommodate emerging changes
- **Stewardship & agency**: engaging with agency expressions that include resistance towards malfunctioning systems, negotiation with current structures and ways of doing things, courage and commitment towards caring actions
- **Monitoring and Evaluation**: applying monitoring and evaluation tools throughout different moments of the research and innovation practices
- **Adaptability:** being open towards emerging changes and challenges, revising views and changing the course of actions (i.e. change shape or direction of research and innovation practices)

(Tassone and Eppink 2015)

Appendix 3: EnRRICH Project Information Sheet
for survey and consultation of stakeholders to generate case studies and identify needs

What is the EnRRICH project about?

The Enhancing Responsible Research and Innovation through Curricula in Higher education (EnRRICH) project aims to improve the capacity of students and staff in higher education to develop knowledge, skills and attitudes to support the embedding of Responsible Research and Innovation (RRI) in curricula by responding to the research needs of society as expressed by civil society organisations (CSOs).[1] This project will focus on the **co-creation of research and learning** to enable students to acquire the broad range of skills, knowledge and experience needed for a knowledge economy and knowledge society to flourish. The project is funded by the European Commission Horizon 2020 Science with and for Society programme, and is carried out by a consortium of 13 higher education institutions and civil society organisations in Europe.

What is RRI about?

Responsible Research and Innovation is an approach that anticipates and assesses potential **implications** and **societal expectations** regarding research and innovation. It aims to foster the design of **inclusive** and sustainable research and innovation. The concept of RRI is important within European funding for research and is a feature of other research funders' schemes too. The RRI framework calls for societal actors (researchers, citizens, policy makers, business, third sector organisations etc.) to work together during the whole research and innovation process to align better both the process and its outcomes with values, needs and expectations in society.

The RRI framework includes the following **keys** or **policy agendas**, which have been developed further through projects funded in this area, including RRI Tools and the EnRRICH project:

- multi-actor societal and **public engagement** with research
- **open access** and easier access to scientific results
- attention to **gender**, and diversity, in research and innovation processes and content
- **ethics**
- formal and informal **science education** and outreach from higher education
- **governance** of research
- sustainability
- social justice

---

[1] Civil society organisations have been described as "the wide array of non-governmental and not-for-profit organizations that have a presence in public life, expressing the interests and values of their members or others, based on ethical, cultural, political, scientific, religious or philanthropic considerations" (World Bank 2010)

EC frameworks and other research in this area identifies a number of dimensions and **process requirements** for researchers and other actors to be part of RRI[2]:

- anticipation
- reflexivity
- inclusion
- responsiveness

Survey and consultation of stakeholders to generate case studies and identify needs

The EnRRICH consortium is interested to hear from academics, students, civil society organisations and others about their experience with RRI, their practices within curricula and courses, and the **opportunities to pilot new elements within courses in order to foster learning, knowledge of RRI and development of appropriate students' RRI competencies**. We aim to get this information by means of surveys and consultation. We particularly seek examples from within Bachelors and Masters degrees, where there is involvement of civil society organisations among other stakeholders or where there may be an opportunity to engage with them. Societal and research issues that we are focusing on with regard to higher education curricula and courses include: health, demographic change, wellbeing, food security, sustainable agriculture and forestry, marine, maritime and inland water management and the bio-economy

---

[2] See 'Report on the Quality Criteria of Good Standard Practices in RRI' for more information on the process requirements http://www.rri-tools.eu/documents/10182/18424/D1.3_QualityCriteriaGoodPracticeStandards.pdf/f7a1d707-5e54-48cb-949b-053dc7c6f36f

Appendix 4: Question suggestions for discussion with lecturers

EnRRICH WP2 project information sheet (attached), EnRRICH website: http://www.livingknowledge.org/livingknowledge/enrrich and EC RRI booklet can be provided to them before or at the meeting (https://ec.europa.eu/research/swafs/pdf/pub_public_engagement/responsible-research-and-innovation-leaflet_en.pdf

- Is there involvement from civil society organisations (CSOs) in proposing projects for students' learning/research in your subject? (What about organisations in other sectors if not.) If yes, how are they involved?

- Do you think that the courses you teach on integrate any of the RRI keys (governance, engagement, gender equality, science education, open access, ethics, sustainability, social justice) either formally or informally?
- If so, how?
- What do you want students to learn about those keys?
- And how are students assessed?

- Do you think that the courses you teach integrate, either formally or informally, any of the RRI process dimensions, namely anticipation, reflexivity, inclusion, responsiveness?
- If so, how?
- What do you want students to learn on this matter?
- And how are students assessed on this?

- Have you had students' feedback about elements they particularly value in those courses or would like more or less of?

- What do you think about RRI as a concept in relation to how your colleagues and/or students might see their learning/research ?

- What do you think are supportive or hindering factors for embedding RRI in curricula at Bachelors, Masters and Doctoral level at your HE institution?

(If conversation has suggested this may be possible)

- Would you be interested in potentially piloting any course content that involved students learning about RRI through involving a CSO / CSOs ?

- Would you be interested in having a course that you currently teach on appear as an example of 'promising practice' in helping students learn about elements of RRI (with civil society organisations)?

(If yes, please fill in the 'Promising practice' document)

Use of data statement

The EnRRICH project will be producing a summary report about embedding RRI in the curriculum. This will include information that has been aggregated from a number of interviews with lecturers and others. Information gathered by your local EnRRICH project member will be shared with other members of the EnRRICH project team for the purposes of generating a report on RRI in the curriculum in European universities.

In the report, we would like to include examples of responses from lecturers on courses at a number of European universities. If the EnRRICH project members responsible for producing this report **would like to identify by name particular lecturers and courses in the report, we will come back to you for your approval or not**.

Are you willing to be re-contacted about possibly being included by name in a future EnRRICH report?

☐ Yes
☐ No

If yes, please provide:

Name _____

Course / Department

_____

University / Higher education institution

_____

E-mail address _____

Appendix 5: Promising practice questions

Students learning about responsible research and innovation – through learning and research with civil society organisations

Name of university

_____

—

Name of lecturer

_____

—

Course name/Academic department

_____

Short description of the course

```



```

Which of the RRI keys do you think are integrated in the course? (tick any/all that apply)

- ☐ Public engagement/ societal engagement
- ☐ Open access
- ☐ Gender and diversity
- ☐ Ethics
- ☐ Science education and outreach from higher education
- ☐ Governance
- ☐ Sustainability
- ☐ Social justice

Do you think that the course helps students to develop any of the following RRI process requirements? (tick any/all that apply)

- ☐ Anticipation
- ☐ Reflexivity
- ☐ Inclusion
- ☐ Responsiveness

Can you provide examples about how the course helps students to develop the RRI dimensions you just ticked?
(you can refer to specific knowledge, skills or attitudes the course attempts to foster)

```


```

Does the course involve students learning / researching with civil society organisations?

☐   Yes
☐   No

If yes, please provide a description of how students learn with/from civil society organisations through this course

```


```

What are the learning outcomes of this course?

```


```

How is the students' learning assessed?

```


```

Please provide weblinks to information about the course, if available, or attach a course outline

```


```

We would like to make the information on this sheet available on the EnRRICH webpages and EnRRICH publications. Would you be happy for the information to be made available in this way?

☐   Yes
☐   No

If so, could you please leave your e-mail address, so that we can contact you if we need more information about your specific case:

E-mail address :

EnRRICH member contact details

Name _____

Email address
_____