D6.1 Embedding and strengthening RRI in the curriculum through pilots and good practice exchange: what we have learned so far

WP3 and WP4 Evaluation Report

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1. Introduction

The Enhancing Responsible Research and Innovation through Curricula in Higher Education (EnRRICH) project aims at building the capacity of staff in higher education to facilitate students’ development of knowledge, skills and attitudes and competencies in Responsible Research and Innovation (RRI), in connection with the research needs of society, particularly underserved civil society organisations (CSOs). In order to do so, the EnRRICH Consortium works at identifying, developing, testing, and disseminating resources, based on existing good practice and trials of new initiatives, to embed RRI in academic curricula across Europe. Piloting of new initiatives and educational materials in curricula (Work Package 3 - WP3) is connected with development of an appropriate pedagogical framework and the identification of virtuous practices (WP2). Knowledge and learning developed through such activities is shared through a good practice exchange programme (WP4).

In order to learn about how ongoing processes can be improved by means of self and stakeholders’ evaluation and to share such a learning among consortium members and beyond, Task 1 of WP6 (which is the EnRRICH WP dedicated to “Evaluation: Learning, stakeholder accountability, approaches”) provides for peer evaluation and mutual learning from WP3 and WP4 to identify best practices and main bottlenecks in RRI curriculum embedment practices and further develop the student competencies and learning outcomes identified in WP2.

In order to pursue such objectives, Description of Action (DoA) provides the following for Task 1 in WP6 (“Formative (learning) evaluation of best practices and bottlenecks in WP3 and WP4”):

“1.1.1 Peer evaluation and mentoring visits to partners involved in WP 3 and WP4 by expert partners or advisory board members. Visits [...] aim at stimulating reflexive evaluation and monitoring participation in projects including by discipline and by gender. These visits will coincide as much as possible with consortium meetings, swap shops or other mentoring visits in the frame of WP3/WP4 or - if necessary- will take place through skype, online interviews and questionnaires. [...]”

1.1.2 Peer evaluators will produce a short semi-structured report including observations, recommendations and metrics. [...] Single reports will be collated into a synthetic report that will serve as an introduction and support material for running focus groups (step 3).

1.1.3 At consortium meeting 3 WP3 and WP4 partners will participate in self-evaluation focus groups. Focus groups discussion will build upon analysis of results of Step 1 activities in order to discuss state of advancement, pros and cons and lessons learnt. At consortium meeting 1 and 2, WP6 partners will start developing a common understanding of evaluation objectives and procedures. Also, main criteria for technical instruments (report format and metrics) will be discussed.

1.2 An intermediate internal report on first results of formative evaluation activities will be shared amongst participants in order to ensure connections between WP3, WP4 and WP2 (M21) [Milestone 18, that has been reported to M22 following on Grant agreement amendments]. A final report on formative evaluation will be delivered (D6.1.) at M26, in order to ensure connections with WP5 (converging into a wider policy brief) as well as discussion at consortium meeting 4 (M30).”
Within such a context, this Deliverable 6.1 reports on peer evaluation activities run so far and draws some together the results mainly based on peer evaluators’ reports and discussions as well as the focus group results.
2. Rationale and method

The EnRRICH project seeks to building learning and understanding by embedding evaluation in the heart of the project. Task 1 of WP6 provides for formative evaluation through peer-to-peer activities, sharing learning and building horizontal links across the work packages and with the stakeholder group therefore accomplishing a learning function (Scriven 1967 and 1980). The formative evaluation is approached by critically reflecting about how the embedding of RRI in HEIs curricula was experimented through piloting and other activities run in WP3 by EnRRICH partners and the good practice exchanges that took place within WP4.

The European Commission identifies three main aims of evaluation: 1) “verifying that public action replies to uncovered or insufficiently satisfied needs”; 2) providing “an opportunity for feedback arising from actions underway”; 3) “reporting to political authorities and citizens on results obtained and on the sound use of allocated resources” (MEANS 1999). The EnRRICH evaluation activities concentrate on the last two aims as the feedback evaluations in particular may support two different but connected objectives: i.e. support decision making and enhance the learning function of the actors involved in a project, programme or policy. This Deliverable report focuses on activities related to this last objective.

Our approach to such tasks implied wide involvement of stakeholders in evaluation by means of participatory techniques that are built on a bottom-up approach. That also implies an explicit reference of the EnRRICH evaluation activities to RRI guiding principles and requirements. Therefore, formative evaluation activities have been based on constant involvement of valuees in the definition of observation standards and methods. Notably, the evaluation exercise made systematic reference to what the RRI Tools project defined as Process Requirements for Responsible Research and Innovation: anticipation, reflexivity, responsiveness and inclusion (Kupper et al. 2015). Thus, the formative evaluation exercise that was run in WP6 of the EnRRICH project can be regarded itself as RRI based, hence an attempt to work out RE – Responsible Evaluation.

This implied that a great deal of time and activities have been dedicated to the development of a shared evaluation framework for assessment criteria and method. In order to develop a common understanding of evaluation objectives and procedures that would orient peer evaluation of activities run under WP3 and WP4, the following activities have been carried out:

1. First definition of self evaluation criteria. During kick off Consortium meeting (July 20-22 2015), all participants have been called to brainstorm to start identifying criteria to guide self evaluation activities. Results of brainstorming have been discussed. As WP leader, UNISS¹ synthesized results and grouped potential criteria within 17 sets of indicators under 6 homogeneous clusters. Results were circulated among Consortium members for cross-validation. (See Annex 2).

2. Criteria and clustering of criteria. During WP leaders meeting in Bonn (Jan. 27-29 2016) an exercise was run to discuss and rank the set of indicators/criteria. Participants were asked to rank all 17 indicators as to two dimensions: processes and results. Follow-up discussion

¹ For a list of acronyms used to refer to EnRRICH Consortium members, see Annex 1.
by participants was facilitated by projecting median ranking scores on a dispersion diagram built around the two axes of processes and results. Analysis by UNISS led to a new clustering of criteria. UNISS synthesized results and circulated for cross-validation. (Annex 3).

3. **Definition of a common set of peer evaluation procedures and instruments.** After cross-validation of new criteria (See below), an on-line consultation has been proposed by UNISS to all Consortium members in order to collect suggestions and ideas useful to operationalise identified criteria. At Consortium meeting two in Dublin (June 20-21 2016), results of on-line consultation were shared and discussed with Consortium members during focus group to orient the definition of data gathering instruments. Tasks distribution among partners in WP6 has been discussed and a training meeting was held thereafter.

**Definition and first clustering of evaluation criteria**

Evaluation is about making judgements. Judgements are the results of the application of certain criteria to what we observe from a specific point of view. Therefore, in order to produce good evaluation one must be as clear as possible as to the point of view and the criteria to be adopted in order to produce such judgements.

EnRRICH Consortium members did not look for “objective measures”. Rather, the idea was one of setting own criteria to guide observations and discussions on what partners are doing and what the results or effects of their activities are. The principle is therefore not to strictly measure anything, but rather produce an understanding of processes and results in order to learn from it.

In order to do so, an exercise was put in place aimed at understanding what EnRRICH Consortium members’ evaluative point of view and criteria were. Such an exercise started with brainstorming activities at kick off Consortium meeting in Cambridge. Building on ideas collected in Cambridge, Work Package coordinator (UNISS) grouped ideas in cluster of homogeneous issues and possible indicators/criteria. This first set of criteria is synthesized in Table 1 (see Attachment 2 of Annex 3 for further specifications). Apart from criteria specifically connected with the object of the EnRRICH evaluation, a significant consistency is to be pointed out about criteria concerning RRI and the dimensions so far identified in literature for that concept [Burget et al. 2017].

Such criteria were then discussed among EnRRICH partners in order to:

1. Develop a shared evaluation perspective and a common understanding of evaluation criteria that would orient peer evaluation of activities run under WP3 and WP4.
2. Develop evaluation instruments to be used by peer evaluators to run their observations during visits, guide them in doing interviews or animating focus groups or group discussion. Such instruments would also be used as guiding lines by partners to orient autonomous reflexive observation and self assessment.
3. Develop templates for the reporting by peer evaluators and general report.
Table 1. First set of evaluation criteria

<table>
<thead>
<tr>
<th>Clusters</th>
<th>Criteria</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>R.R.I.</td>
<td>Policy agenda (RRI keys)</td>
<td>POLAG</td>
</tr>
<tr>
<td></td>
<td>Process Requirements</td>
<td>PROREQ</td>
</tr>
<tr>
<td>Stakeholders’ involvement</td>
<td>Stakeholders’ involvement in planning</td>
<td>INVPLAN</td>
</tr>
<tr>
<td>(Students, academics, staff, CSOs,</td>
<td>Stakeholders’ involvement in activities</td>
<td>INVACT</td>
</tr>
<tr>
<td>other stakeholders)</td>
<td>Stakeholders’ involvement in Process and Method</td>
<td>INVPM</td>
</tr>
<tr>
<td>Contents of Pilots (First level</td>
<td>Attainment of students’ learnings</td>
<td>STULEAR</td>
</tr>
<tr>
<td>level Outputs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curriculum development</td>
<td>Disciplines involved</td>
<td>DISCINV</td>
</tr>
<tr>
<td>(Second level Outputs)</td>
<td>Transdisciplinarity</td>
<td>TRANSDIC</td>
</tr>
<tr>
<td></td>
<td>Embeddedness</td>
<td>EMBED</td>
</tr>
<tr>
<td></td>
<td>Range of courses</td>
<td>ROC</td>
</tr>
<tr>
<td></td>
<td>Study levels</td>
<td>SLEV</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Learning outcomes</td>
<td>LEAROUT</td>
</tr>
<tr>
<td></td>
<td>Organizational outcomes</td>
<td>ORGOUT</td>
</tr>
<tr>
<td></td>
<td>Profile of science shops and courses</td>
<td>PSS</td>
</tr>
<tr>
<td>Impacts</td>
<td>Trustfulness and visibility</td>
<td>TRUVIS</td>
</tr>
<tr>
<td></td>
<td>Organizational impacts</td>
<td>ORGIMP</td>
</tr>
<tr>
<td></td>
<td>Sustainability and continuity of action</td>
<td>SUSTCONT</td>
</tr>
</tbody>
</table>

In this view, during WP leaders meeting in Bonn (Jan. 27-29 2016) an exercise was run to further define, discuss and rank the set of indicators/criteria. Participants were asked to rank all 17 criteria on a scale with 17 positions ranging from most important (= 16) to less important (= 0). It was intended that zero or close to zero score don’t mean that that particular indicator/criterion is not considered important/relevant in itself. Rather, the criterion is still considered important (since EnRRICH partners identified it), yet less than others.

Participants were called to indicate importance/relevance of indicators/criteria as to two dimensions: processes (how important is a particular criterion as to what and how we are
things are being done) and results (how important is a particular criterion to make a judgement as to the effects of what is being done).²

Figure 1. Mapping criteria and clusters

After ranking, participants were asked to comment on main differences among their rankings so to clarify their understanding of criteria under discussion. Main comments concerned the following:

1. Transdisciplinarity (TRANSDISC)³: it is important in the overall project. Not necessarily in every individual pilot (this applies also to other indicators: see below)

2. Process requirements (PROREQ): they are to be incorporated in the way we work out things (process). It is expected that this will lead to results as to policy agenda (RRI keys) (POLAG).

3. A certain overlapping exists among students learning (STULEAR) and learning outcomes (LEAROUT). Discussion helped some disentanglement: STULEAR mainly concerns students in the short run (embedding in pilots); whereas LEAROUT is to be intended as applied to stakeholders in general and how they make use of products/results (thus, it concerns fallouts on a medium-long term).

² The exercise was conceived mainly by referring to Marradi 1998 and Bezzi-Baldini 2006.
³ Again, see Attachment 2 in Annex 3 for the full correspondence of acronyms with short description of criteria.
Projection of medians of ranking assigned by participants on a Cartesian diagram helped visualize the indicators as to their positioning and reciprocal relationships. Brief discussion led to identification of four main clusters of indicators that share close positions on the graph and similar features.

The clusters

A. A first cluster includes outcomes and impacts that are unlikely to be produced in the life course of pilots. Therefore, it was suggested that evaluators would try to figure whether conditions are there for those effects to take place in the future (are they taken into consideration in setting pilots? Are they likely to happen?). Typically, they concern medium and long term effects on organization as well sustainability and continuity of initiatives undertaken under EnRRICH.

B: This cluster includes issues that partners consider as most important both as to how things are getting done in pilots (processes) and as effects and results of actions (what students learn and how learning is embedded in programs underpinnings; trustfulness and visibility of what we do and how we do it; embedding of pilots in the curriculum).

C: This cluster includes issues that are relevant as to how things are getting done (Involvement of stakeholders in activities and projects management, but also the embedding of process requirements in what we do).

D: This cluster includes issues that are to be assessed as far the whole EnRRICH project is concerned, rather than the single pilots. The range of courses that we’ll deal with, rather than the number of disciplines involved and study levels concerned (BA, MA, PhD) are issues that partners think should be pursued at a project level, rather than for single pilots and actions.

INVPLAN holds a peculiar position that would lead to include it in cluster D. Nonetheless, it looks much closer in meaning to indicators grouped under cluster A. Such positioning could be due to contingent reasons, but it could also be indicating that some difficulties exist in pursuing/working out stakeholders’ involvement in planning activities.

Further developments on criteria and method

Ranking and diagram projection led to quite clear indications about how to group indicators/criteria. Therefore, their clustering did not seem to need further development. Follow up activities were needed to develop further specification of indicators/criteria meanings as well as the sharing of such meanings among EnRRICH partners and peer evaluators. In fact, not all the participants in the Bonn exercise regarded all criteria in the same way. The following steps were thus adopted:

1. UNISS updated the list of indicators/criteria and underlying meanings by referring to observations gathered through distance consultation and Bonn discussion.

2. UNISS developed a web questionnaire and invited all EnRRICH consortium members to fill it in. The questionnaire asked respondents to identify one question for each
indicator/criterion that respondents would think useful to gather information during evaluation. Room was provided for respondents to briefly explain their choice.

3. Questionnaire information was pulled together by UNISS. On such basis, draft instruments for evaluation (interview and focus group guides, observation grids) and reporting templates were elaborated and proposed for sharing and discussion notably with WP6 partners by means of on-line meetings and at Consortium meetings where actual peer evaluation activities were planned in more detail. The whole process of criteria development and sharing was widely participated and involved all participants. Steps and participatory method and techniques were also validated with EnRRICH Advisory Board members at Consortium meeting in Dublin. Since DoA explicitly provided for “Evaluation procedures and methodology [to] be presented and discussed at conferences, where advancements [would] be possible thanks to confrontation with a wide stakeholder’s audience”, the participated process of evaluation criteria development and sharing was presented at the Engage Conference organized by UK’s National Co-ordination Centre for Public Engagement in Bristol in early December 2016. Follow up discussion provided with further hints to refine criteria and instruments.

A planning for peer evaluation was agreed upon with Consortium members and notably with partners involved in WP6, also according to PM resources. A peer evaluation table was thus set as show in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>evaluates</th>
<th>VECHTA</th>
<th>and</th>
<th>WU</th>
</tr>
</thead>
<tbody>
<tr>
<td>VUB</td>
<td>evaluates</td>
<td>UNISS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QUB</td>
<td>evalua...</td>
<td>UCC</td>
<td>and</td>
<td>UoL</td>
</tr>
<tr>
<td>UNISS</td>
<td>evaluates</td>
<td>VUB</td>
<td>and</td>
<td>VTDK</td>
</tr>
<tr>
<td>DIT</td>
<td>evaluates</td>
<td>QUB</td>
<td>and</td>
<td>DIT</td>
</tr>
<tr>
<td>CUB</td>
<td>evaluates</td>
<td>CUB</td>
<td>and</td>
<td>IS</td>
</tr>
</tbody>
</table>

According to methodological principles of non standardized approaches to social and evaluation research (Denzing and Lincoln 2000; Marradi 2008), the setting up of observation criteria as well as technical instruments for gathering empirical information was developed by means of constant adjustments through progressive trials that involved different partners at different stages of peer-to-peer activities. After shared definition of a peer evaluation guide, a first round of peer evaluation activities was run between November 2016 and January 2017. Results were shared among WP6 partners on the basis of reporting templates (see Annex 4) filled in prior to discussion during Consortium meeting in Barcelona (January 31st to February 3rd 2017). During that same meeting a focus group was run in order to get a

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deeper understanding of learning elaborated through first round evaluations and develop a
greater confidence in prospects methodology and instruments. This led to the finalization of
a Peer evaluation guiding tool⁵ that would serve as a reminder and guide for information
gathering during peer evaluation activities, as well as to set the structure for individual Peer
evaluation reporting.

As said, the work of peer evaluators was dedicated to the observation of a large number of
activities run within WP3 and WP4. Yet, the focus was mainly on pilots run under WP3,
whereas WP4 activities promoted the exchange of good practices underlying them. Before,
getting further into the analysis of observations emerging from peer evaluation, the main
features of those two WPs can be here schematically recalled.

According to DoA, WP3 (Piloting RRI educational materials in Higher Education curricula)
pursued the following objectives:

1. To share information, and repurpose and develop resources emerging from WP2 for
   trialling in particular Higher Education curricula
2. To support and develop teaching staff in higher education to integrate RRI methodologies
   in student programmes and modules and to sustain this practice
3. To work collaboratively with civil society organisations, professional associations, social
   enterprise and national bodies to renew curricula and integrate the RRI keys
4. To select existing or newly developed courses for piloting RRI methodologies across
   different levels, i.e. undergraduate and postgraduate, and share the case studies and
   teaching resources arising from these trials
5. To identify opportunities to embed and sustain RRI methodologies and teaching practices
   through building collaborations to share resources and practices, using targeted
   dissemination (via WP7) and leveraging institutional, regional, national, European and
   international policies (linked to WP5).

Table 3 shows a list of examples of pilots that were run under WP3 by EnRRICH partners.

Table 3: Examples of EnRRICH Pilots run in WP3

<table>
<thead>
<tr>
<th>Module or Workshop Title</th>
<th>Institution</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>RRI Workshops for students in Tourism, Spatial Planning</td>
<td>Dublin Institute for Technology, Ireland</td>
<td>U</td>
</tr>
<tr>
<td>Seminar for students in Social Work on RRI and Research-Mindedness</td>
<td>Queen’s University Belfast, UK</td>
<td>U</td>
</tr>
<tr>
<td>Participatory Research with Regional Actors</td>
<td>University of Vechta, Germany</td>
<td>B/M</td>
</tr>
<tr>
<td>Visual Advertising Module and Professional Development Module</td>
<td>Vilnius College of Technology and Design, Vilnius</td>
<td>B</td>
</tr>
<tr>
<td>Reason And Engage: Critical Reflections on Humanity and Society</td>
<td>Vrije Universiteit Brussel, Belgium</td>
<td>M</td>
</tr>
</tbody>
</table>

⁵ An extended and an abridged version of the tool were provided for in order to comply with different operational
needs during planning and managing of peer evaluation activities (see Annex 5).
| Making the Most of Masters                          | Queen’s University Belfast, UK | M   |
| Community Based Action Research Module            | Università degli Studi di Sassari, Italy | M   |
| Community based learning courses and thesis seminar | Corvinus University of Budapest, Hungary | M   |
| Piloting RRI methodologies in curricula of higher education | Wageningen University, Netherlands | M   |
| Community based research Participatory Research Module | University College Cork, Ireland | PhD |
| Qualitative Research Methods Workshop             | Corvinus University Budapest, Hungary | PhD |
| Workshop on RRI and Community Based Research      | Dublin Institute for Technology, Ireland | PhD |

According to DoA, WP4 (Strengthening RRI in curricula through science shop work – good practice exchange and pilots) pursued the following objectives:

1. Support incorporation of RRI in higher education curricula through Science Shops and other community knowledge exchange mechanisms, starting and mentoring new practices and sustaining already established practices.

2. Exchange and pilot good Science Shop practices in higher education curricula across different countries and share the case studies and learning arising from these pilots through a Community of Practice (CoP)

3. Gather community based knowledge on common grand societal challenges in curricular activities, in partnership with a wide variety of societal stakeholders, in order to obtain European wide data and recommendations on how to address the societal challenge

4. Evaluate outcomes for all stakeholders, in order to test science shop projects as a mechanism to integrate RRI in HEI curricula.

Table 4 shows a list of ongoing and new Science Shops that were supported through the EnRRICH project.
<table>
<thead>
<tr>
<th>Ongoing Science Shops supported through EnRRICH</th>
<th>New Science Shops started within EnRRICH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetenschapswinkel, Vrije Universiteit Brussel</td>
<td>Science Shop, Corvinus University Budapest</td>
</tr>
<tr>
<td>Science Shop, Queen’s University Belfast</td>
<td>Science Shop Vechta/Cloppenburg, University of Vechta</td>
</tr>
<tr>
<td>Community-Academic Research Links, University College Cork</td>
<td>Living Lab for Health, IrsiCaixa AIDS Research Institute</td>
</tr>
<tr>
<td>Foist Laboratory, University of Sassari</td>
<td>Boutique des Sciences, Université de Lyon</td>
</tr>
<tr>
<td>Students Learning With Communities, Dublin Institute of Technology</td>
<td>Science Shop, Vilnius College of Technologies and Design</td>
</tr>
<tr>
<td>Wetenschapswinkel/Onderwijsloket Wageningen University</td>
<td></td>
</tr>
</tbody>
</table>
3. Results of peer evaluation activities

According to the peer evaluation table EnRRICH Consortium members involved in WP6 run peer evaluation activities, as said, starting in November 2016. Table 5 summarizes main activities and their timing.

Table 5. Main activities and timing for peer evaluation

<table>
<thead>
<tr>
<th></th>
<th>VUB</th>
<th>Vechta</th>
<th>WU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Visit</td>
<td>On-line and Dec 2016</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dec 2016</td>
<td></td>
</tr>
<tr>
<td>QUB</td>
<td></td>
<td>UNISS</td>
<td>UCC</td>
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<tr>
<td></td>
<td></td>
<td>Visit</td>
<td>On-line and visit March 2017</td>
</tr>
<tr>
<td></td>
<td></td>
<td>June 2017</td>
<td></td>
</tr>
<tr>
<td>UNISS</td>
<td></td>
<td>UoL</td>
<td>VUB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Visit</td>
<td>On-line and visit March 2017</td>
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<tr>
<td></td>
<td></td>
<td>March 2017</td>
<td></td>
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<tr>
<td>DIT</td>
<td></td>
<td>VTDK</td>
<td>VUB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Visit and on-line Dec 2016</td>
<td>On-line and visit January and May 2017</td>
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<tr>
<td></td>
<td></td>
<td>Dec 2016</td>
<td></td>
</tr>
<tr>
<td>CUB</td>
<td></td>
<td>QUB</td>
<td>DIT</td>
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<tr>
<td></td>
<td></td>
<td>Visit</td>
<td>Visit May 2017</td>
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<td>UoL</td>
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<td>On-line</td>
<td>On-line and June 2017</td>
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<td></td>
<td></td>
<td>January 2017</td>
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</tbody>
</table>

Reports by peer evaluators on pilots run by partners sum up observations of experiences that may vary very significantly. Cases are of course context specific as to at least five levels:

1. National policy context, Higher Education Systems’ governing rules and norms
2. Institutional governance and strategy
3. Intra-organizational dynamics (at course and/or department level)
4. Interpersonal relations and dynamics
5. Science shop’s organizational model and/or stage of development

Nonetheless, some general patterns can be observed. Given the formative nature of the evaluation exercise, inferences cannot be generalized. Rather, they can be referred only to the experiences that were evaluated. This is consistent with the methodological approach adopted in order to stimulate reflexivity among evaluees for evaluation to serve a learning function (Scriven 1980). These results will be further shared and discussed among EnRRICH Consortium members in order to produce new learning and more in depth insight about the
whole experience. This will help partners in getting an in-depth and at the same time comprehensive understanding of connections existing among the issues that were dealt with within different WPs, notably WP2, WP3, WP4 and WP5.

Although not generalizable, the results of this evaluation exercise provide food for thought based on empirical evidence that may be useful to orient programmes and actions aimed at embedding RRI in the curriculum.

Evaluation Reports provided by peer evaluators were collated together within the different sections of the reporting templates. Excerpt collated in each sections were then analyzed by means of a SWOT scheme with the aim of identifying main enablers and bottlenecks in EnRRICH partners’ experiences in running pilots to embed RRI in the curriculum.

Following are some results of that analytical exercise.

Most citations included in the following pages are excerpts from reports compiled by peer evaluators. Each citation is marked with acronyms of peer evaluator and of evaluatee (for instance, UoL re IS will mean that excerpt is taken from peer evaluation report produced by University of Lyon on Irsi Caixa).

Current outcomes

This section builds on evaluation criteria focused on the defining main outcomes of the RRI pilots in terms of curricula (program or module) design, students learning and competences acquired by students. Peer evaluators’ interest was mainly addressed to learning about the effects and results of activities and actions promoted through EnRRICH.

Curricula/course design

Coherently with the Science Shop approach, most pilots were characterized by a problem based approach (most often implemented through Community Based Research). This is from the very beginning the explicit challenge of the EnRRICH project that aims at trialling the introduction of RRI in the curriculum by means of a Science Shop approach, thus connecting course design and contents to the needs of different stakeholders:

– Students: who were able to apply abstract knowledge to real life experience;
– Teachers and lecturers: who were able to innovate, refresh, find new stimuli in their work;
– CSOs: who have work done to progress their issues they brought to the Science Shop.

This could be done often by connecting to grand societal challenges (GSCs) and/or sustainable development goals (SDGs). This implies taking actual societal actors’ needs in serious consideration and connecting them to a wider context. Connections can thus be made between the larger picture of GSCs and SDGs and their practical implications in people’s and communities’ daily life.
The Science shop weren't involved in first run of module, they have gradually been incorporating RRI through discussion with the course coordinators – eg Problem-based learning (PBL), CSO collaboration. Learning outcomes for the module are close to EnRRICH competencies: developing critical thinking, learning about societal topics, developing their thinking on the societal group and issue – reflecting in a critical way about big societal issues. The students aren't used to a very open approach, so they introduce the module topic (this year the topic was migration) through guest lectures, and giving them readings, to form their opinions, then break them into interdisciplinary groups to work on PBL projects. 6 groups work on themes from CSOs, eg one is representations of migrants in the media – groups pick from relevant research questions from interested community partners, and agree on a plan for doing the research, and on the output (eg recommendations for policymakers). The plan is to make them more self-directed, while still being collaborative. […] For next year [Science Shop staff] and course coordinators have rewritten the course, calling it community service-learning. (DIT re VUB)

Students are working on projects with real problems of organisations, we wanted to use the RRI framework to support the students to develop capabilities for doing RRI. Starting point was that, engaged with teachers etc. Developed together ideas on how to do that. (VUB re WU)

During all of the CBR/RRI pilots, students engaged in a real life learning experience while working with the partners on projects which were developed in collaboration with partners. In all cases, the lecturer worked extensively with the partner to design the brief for the pilots to make sure they were useful for them while using the RRI process requirements as a guiding tool during this activity. In each case, students were expected to respond to the brief created by the lecturer and partner, and to continually reflect upon and communicate their own and the partners’ expectations, and to evaluate and incorporate feedback into the project as the project developed. (DIT re VTDK)

That approach was consistent with the reference scheme on domains of learning to articulate learning outcomes that was developed within WP2 and presented in Deliverable D2.3. (p. 22).

*Figure 2. Reference scheme in EnRRICH D.2.3.: Domains of learning for articulating learning outcomes according to their instrumental or emancipatory character*
In order to be consistent with that approach, openness and flexibility were the main features of pilot design work. This often led to the widening of the range of interrelations and operational possibilities with stakeholders (see below: Stakeholders’ involvement and process requirements sections). Students and CSOs particularly expressed their enthusiasm for the novelty and freshness that this approach is able to bring into the learning and partnership experience. Students notably expressed their appreciation for their voice being heard and concretely being taken into account.

The downside is that that is very challenging and resource intensive: it implies a great deal of motivation, engagement and time, time, time, along with relevant relational capacities.

In that respect, the existence of specific structures with clear mandate and experienced professional capacity like Science Shops is shown to be crucial at every operational stage – planning, implementing and evaluating – as well as in order to ensure sustainability and continuity of action (see below). Notably, Science Shop like structures can count on often already existing networks with civil society actors where relationships are often characterized by mutual trust. As a matter of fact, several pilots were started building on already existing relationships with CSOs and/or research questions that were already in the Science Shop database. This ensured the possibility to establish meaningful connections between curricula/course design and societal actors’ needs in a relatively rapid and effective way.

The science shop coordinator and the course coordinators had complementary skills and work – their academic work and the ability of [Science Shop personnel] to bring CSO questions. (DIT re VUB)

Another clear advantage that the Science Shops’ experience brings in while designing curricula/courses related to societal actors’ needs concerns the already existing cognitive and practical resources needed to provide for safe learning spaces for students which are connected to a deep understanding and ability to deal with stakeholders’ expectations and with often challenging situations and contexts (see below).

Nonetheless, the issue was raised within several pilots about the great deal of resources needed to get the courses set up and running which demanded for a great deal of work that is rarely valued and rewarded by Higher Education Institutions unless a peculiar alignment of conditions is there (see below, the section on Sustainability and continuity of action).

**Embedding**

As said, several pilots built on existing relationships with lecturers and CSOs in order to be able to embed RRI in curricula/courses by means of a problem based approach. Whether or not explicitly referred to GSCs or SDGs, the problem based approach strongly connects with specific students’ learning (see below) as well as to the issue of their future employability.
As a general rule, the problem based approach showed the most useful to address issues otherwise excessively abstract and distant from the students’ experience. Students’ comments are unanimous in appreciating that fact.

Student evaluations of the course were generally positive, and even those factors that were less positive left an impression of learning. They felt that the course ‘challenged their way of thinking’ and gave them ‘learning to avoid stereotypes’. Key elements they identified included ‘knowing and understanding different points of view about the project’ ‘being part of a discussion, not only memorising data but getting our own conclusions, ideas and beliefs on it’. These issues came up with several of the student evaluations. (QUB re UNISS)

Positive remarks also concern the possibility to cut across disciplines. Sensitization to partnership and associative work was high: students seemed to appreciate very much that aspect and have started a relevant learning experience through pilot (class). They seemed to have acquired a certain degree of self-confidence and the will to dare. (UNISS re UoL)

Notably, whatever, in the approach to ways and means to embed RRI in the curriculum, most reports point out the fact that a distinctive feature of the problem based approach enabled connections and cross-fertilizations among different students, disciplines, courses, actions, activities, research work. Positive connections between teaching, research and third mission activities have been frequently observed, sometimes enabling collaborations even at institutional level among different sectors.

The nature of the issue/problem to be addressed gave in some cases the possibility to associate different activities thus giving the possibility to overcome the complexity of certain issues. For instance, in some pilots, a complex problem has been broken down in different levels of complexity and/or difficulty, and into different sub-issues that could be addressed through different teaching and learning activities (UNISS, VTDK). The positive combination of those activities allowed to deal with complex issues and to partially overcome the problem of time management (see below). In fact, different aspects of the same issue can be dealt with by associating it to BA, MA and PhD courses, and/or by means of a combination of teaching and research intensive activities. Where the different students came into contact with each other, positive fallouts have been observed on knowledge exchanges, peer mentoring and further learning.

We found a natural mentoring system emerged between previous and existing PhD. We would be happy to formalise that. (UNISS re UCC: excerpt from interview)

The breaking down of a problematic issue into smaller and less complex issues seems to be a key to address one major problem that was observed in several pilot experiences: the alignment of the different time frames. In fact, courses and curricula are forced into specific time frames that are hardly compatible with those of real world problems and/or with the
community partners’ time frames and resources. This issue is a major one that must be carefully considered while designing the course/activity: if not adequately addressed, it could lead to frustration and eventually failure of the whole work.\(^6\)

More broadly speaking, two different approaches of embedding RRI in the curriculum were observed in pilot experiences. Although the definition of RRI (?) is actually excessively rigid when considered in relation to actual practices, we might distinguish between top-down and bottom-up approaches in designing the course/curriculum, the second approach being the more widely observed in pilots run within the EnRRICH project. Typically, top-down approaches address the course/curriculum design issue mainly (although not exclusively) through hierarchic relationships with Department and or Course coordinators/directors identifying courses/disciplines/lecturers. Eventually, this may happen by means of a democratic decision making process; yet, it is strongly characterized by the fact that the process is initiated at higher institutional governing levels. On the contrary, in the bottom-down approach, initiative is taken at lower/individual level and then brought up to higher decisional instances for validation. Both processes depend on highly motivated people. Once again, the existence of a Science Shop or similar structure is crucial to keep the process moving in the right direction and positively develop.

The FOIST Laboratory where the EnRRICH project is based in the University of Sassari has a long history of working with communities and societal actors. During the evaluation meetings I could see the longstanding nature of some of the relationships between the FOIST lab and CSO representatives. (QUB re UNISS)

As it might be expected, bottom-up approaches enable wider and more significant stakeholders’ participation (see below). Yet, the choice between the two (which, once again, must be considered as theoretical opposites) very much depends on the actual conditions on the ground, rather than upon other kind of considerations.

The Director of the area including the Science Shop told the Science Shop coordinator that this module was being planned, so the Science Shop coordinator talked to the professor, who didn’t seem very interested. The coordinator tried to approach the professor again once EnRRICH was approved and the course was validated, but they still weren’t very enthusiastic, then the coordinator approached the course coordinators, and had a productive discussion with them. Through direct liaison with the course coordinators, she persuaded them to suggest the PBL/Science Shop approach to their advisory board. Generally these were informal processes, and were very positive. […] It’s important to have a supportive manager who is looking out for opportunities, to embed RRI in the curriculum. Direct contact with the people delivering it on the ground is important.

Now the Science Outreach Office (Science Shop) is officially named as the partner in the module (it wasn’t the first year). It’s important to have this as strategic plans are being developed, as the funding cycle ends in December. (DIT re VUB)

\(^6\) This is a well known problematic issue in CBR. See Merler and Vargiu 2008.
Those two theoretical approaches were observed in combination with two other possible options which consists in either build on previously existing courses/activities or opt for the design of totally new activities. That second option was less easily viable, especially in contexts with rigid regulations and norms.

As they were feeding into an existing module, Science Shop staff had the feeling that it might be too vague/broad a project, that the outcomes weren't really useful to the CSOs, they were contributing without really getting anything back. That's why the plan for next year is to collect specific questions from them on the topic (last year they looked at general questions from the Science Shop database and adapted those). (DIT re VUB)

Through brainstorming with [Science Shop personnel], contact with Phil MacNaghten (cfr. Stilgoe), course is built on another course, re-designed an already existing course, using the RRI framework. (VUB re WU)

What is interesting in the genesis of this change in the “Business projects” course is that the proposal to bring in some CSO needs emerged from a former student. The connection with societal actors was thus realized through an umbrella CSO (Hungarian but operating worldwide) [...] and supporting social projects. For [for profit organization which was also partner in the project] too this was the first time they collaborated with a CSO, what appeared clearly since they didn't “speak the same language” as the CSO. (UoL re CUB)

Furthermore, it can be very schematically said that – other things being equal – top-down approaches are more related to new course/activity design, while bottom-up approaches were more used while embedding new contents/activities in pre-existing courses. Once again, the choice between those two combinations largely depends upon contextual conditions. Generally speaking, the second one (bottom-up approach to re-design pre-existing courses) ensured more flexibility and openness (see further considerations below).

One further difference when it comes to embedding RRI in curricula regards what could be defined quantitative vs. qualitative approaches. EnRRICT partners largely built upon Science Shop like experiences in approaching their pilots. Typically – yet, not exclusively – Science Shop projects involve a rather limited number of students and lecturers (on a one-to-one or two-to-one basis), whereas the challenge of pilot experiences was to enlarge the number of actors involved, notably students. The number of students actually involved in pilot activities largely varies from about half a dozen taking part in selective (and often rather extended over time) course, to larger classes or single modules that could be extended to a greater audience (sometimes including community members), to short (one week to one day) experiences with a very large number of participants (like the 191 people involved in one of the hackathons run by UoL). As to those different options, it was observed that larger numbers of involved people leave less room for quality of the relationships and depth of the learning experience. At the same time, large numbers of participants imply higher visibility
and are often more compatible with the institution’s need to expose large number of students to original and alternative learning experiences.

Pilots (class and challenge/hackathon) have been designed to explore possible ways of connecting with university's demands. Innovation was sought in order to side science-shop projects with pilots that could impact a larger number of students. In that sense, it can be said that pilots were successful in meeting demands expressed by internal stakeholders. Connections with external stakeholders was less in depth than usually is for ordinary science shop projects, as interaction with societal actors could not occur continuously. Rather, it was mediated most of the time and reduced to short term events. (UNISS re UoL)

A trade-off between quality and quantity clearly exists, that could be formulated as intensity vs. extension in order to avoid value judgements. Nonetheless, building on previous considerations about the possibility to break down issues to be addressed through a problem based approach to learning into different tasks and activities could be considered to positively connect intensive with extensive initiatives. Once again, though, this raises the issue of the human and time resources that are to be mobilized, although one might think that some sort of economy of scale could be worked out.

**Students' learning**

Students very much appreciated the possibility to work with real life issues and learn experientially from them. Some of them were challenged with the possibility of societal engagement for the first time: they appreciated that opportunity and seem to have learnt a lot from it also as future professionals and as citizens (see below).

They often express appreciation for the unorthodox learning environment that was created for them as well as the possibility to see interconnections among disciplines, especially when confronted with very open learning experiences. Openness can, nonetheless, initially disorientate students that are more used to be lead through a pre-established and clear-cut learning agreement. And being asked to actively take part in shaping the learning experience can be excessively demanding for some students, whereas others seem to deeply appreciate their voices, needs and thoughts being seriously taken into account. Some others might feel uncomfortable to work outside the comfort zone; yet, once they accept the deal, they find thinking and acting outside the box quite rewarding also as to their personal overall growth.

The students aren't used to open briefs, they prefer exams as more clear-cut assessment, they need more structure. They're not used to this approach. Student take-up is low as the openness of the module can be a bit intimidating. (DIT re VUB)
Student evaluations of the course were generally positive, and even those factors that were less positive left an impression of learning. They felt that the course ‘challenged their way of thinking’ and gave them ‘learning to avoid stereotypes’.

Key elements they identified included ‘knowing and understanding different points of view about the project’ ‘being part of a discussion, not only memorising data but getting our own conclusions, ideas and beliefs on it’. These issues came up with several of the student evaluations. Students struggled a little with the open nature of the course and the new approach involved. (QUB re UNISS)

Students’ mutual mentoring and co-learning was a way to deal with the difficulties of some and the great interest of others in dealing with such challenges. Successful experiences were based on great care in anticipated arrangements to provide for safe spaces for experimenting even in tough and potentially conflicted situations.

Co-learning also often meant that students learned to work in a collaborative environment to pursue own concerns (namely learning) by serving collective interests.

Pilots were interesting insofar as to the possibility for students to practice collaboration rather than competition (although the challenge pilot stresses more the competition dimension). Students learned how to work together for a common objective serving a larger interest than their own. (UNISS re UoL)

The challenge there is to conciliate general interest (by embedding CSOs) and personal goals (by involving in the project partners that will count in students curricula). Whereas the CSO could be previously unknown by the students, Mc Kinsey reputation and affinity with their way of working has represented the reason number one for some students to apply for this project. (UoL re CUB)

Results are very significantly connected to the lecturers’ capacities in anticipating and dealing with fluid situations and the students’ motivation and commitment. Science Shops or similar entities here play the key role in ensuring both are going to be present and in valuing and fostering them.

The science shop coordinator and the course coordinators had complementary skills and work – their academic work and the ability of [Science Shop personnel] to bring CSO questions. (DIT re VUB)

This evolution in the curricula was facilitated by the familiarity of the course coordinator with the RRI issues (through his participation in meetings with EnRRICH partners). (UoL re CUB)

Students worked directly with the CSO, listening to their views and their priorities for the future, and together with FOIST developed a clear plan which was then workshopped with the CSO representatives. (QUB re UNISS)

As a matter of fact, it could be said that most successful experiences were realized by incorporating the RRI process requirements that have been identified within RRI Tools.
Reflective elaboration of EnRRICH Consortium members about the systematic implementation of that reference scheme throughout several activities developed in WP3 and WP4 of the EnRRICH Project is presently ongoing. At the present stage of the conversation, some hypothesis are being discussed about the possibility of working on the concept of RCDT – Responsible Curriculum/Course Design and Teaching as the mirroring approach to RRI in planning and running learning experiences (see below, the section on Process requirements). Following are some elements that are presently under discussion and which will be further developed within future EnRRICH activities.

In fact, in the course of evaluation focus group (which took place on February 2nd 2017 during Consortium meeting in Barcelona) on the bases of first results emerging from peer evaluation activities, remarks emerged about the embedding of RRI process requirements in approach and method adopted to design and manage pilots. Conversation about the subject also continued in following months and is still ongoing.

During focus group, observations were made about the fact that process requirements were often significantly present in the students’ learning experience. That is the case when students had the opportunity not only to learn about process requirements as abstract concepts, but to practice them throughout their learning experience.
Once again, conversation about the concept is on its way. Yet, to summarise the present state of debate, it could be said that what is here tentatively called an RCDT approach was put to work by means of a systematic reference to and use of RRI process requirements at different levels:

− Course design and management (inclusion, anticipation, reflexivity and responsiveness being embedded in the making and running of learning activities);

− Students’ experience (inclusion, anticipation, reflexivity and responsiveness being embedded in the learning practices experienced by students);

− Course content (inclusion, anticipation, reflexivity and responsiveness being one of the issues dealt with in the learning activity).

Several instruments were developed within pilots in order to work out RCDT at different levels by partners. It may here be worth mentioning reflective journals that were used within WP3 upon indication of WP leader UCC (and shared also thanks to WP4) to be used both at the pilot design and management level and to orient the students’ experience. One other such instrument was the framework scheme developed in connection with WP2 attainments by WP leader WU which provided three questions for each process requirement for students how to responsibly deal with their project in the pilot.

[Students] used the framework to design their project, for each dimension I designed three questions they had to answer during their own project.

I have given the framework to the students, asked them to look at their project first in terms of dimensions and how their project is touching those dimensions. They had to pick one competence they think they had to develop further, each student selected one competence, they engaged into experimenting with that competence throughout the competences. They are using the RRI framework very explicitly. (VUB re WU: excerpt from interview)
Yet, it would be limiting to say that the students’ learning was confined to the specific dimensions of RRI. Rather, it was often observed that in several pilots RRI principles and dimensions prompted learning directly connected with responsibility (being a responsible professional, being a responsible citizen etc.) along with an in depth understanding and appreciation of engaging with the community and the acquisition of specific and general competences needed to productively engage, notably professional skills and life skills that are difficult to address in more classic teaching practices.

While compared with RRI process requirements, most partners found it more difficult to address all the RRI dimensions or policy agendas (ethics, gender equality, governance, science education, public engagement, open access, sustainability) explicitly as course contents. As a general rule, issues like ethics, public engagement and sustainability were easier to be dealt with expressly with students. Yet, whereas process requirements can be applied to any kind of process, in different ambits and at diverse levels, RRI dimensions are underlying policy issues generally more easy to connect to the governance of research and innovation: albeit declinable in other policy context, they must be mainly dealt with at the policy level and are therefore of interest for teaching addressing that specific level. This was the case, for instance, of some of the pilots run by CUB or UNISS whereas they were more expressively addressing policy issues, or of the activities such as those run by IS to ensure wide understanding of RRI per se.

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### Framework questions for students’ design and management of RRI projects (WU)

**ANTICIPATION**
- Who and what might be affected with your RI project in the future?
- What are things/aspects you don’t know about related to your RI project?
- What if your project is successful? What will possibly happen?

**REFLEXIVITY**
- What are you working on and why? Why does it matter?
- Who will take responsibility if things go wrong in your RI project?
- How do you know you are doing the right thing?

**INCLUSION**
- Who is part of your RI project? How do they benefit? And who is not part of your project and what are their risks of not benefitting?
- What should the stakeholders know about your project?
- How will you deal with the issue of power differences in your project design?

**RESPONSIVENESS**
- How will you respond to emerging changes (new knowledge or/and emerging perspectives, views and norms) being aware of the strict project duration?
- What are alternative approaches to your project design?
- Diversity is seen as an important feature of responsive innovation (to make it productive, resilient and adaptable). How are you welcoming diversity in your project design?
Trustfulness and visibility

EnRRICH partners generally agree on the fact that the project gave them great visibility within their own institution and community. Several of them have run training and seminar activities for staff members in order to promote RRI principles and concepts. Those activities along with initiatives addressing large students’ population were very much appreciated and in certain contexts have contributed to significant advancements in the promotion of RRI and of the operating units that favour that and will possibly contribute to further advancements in the future (see below: Sustainability and continuity of actions).

[...] an online platform was used to share processes, data, results. [...] Dissemination [was] done through meetings during this pilot project. A big congress [was] organized at the end, with directors from Irsi Caixa invited : the impact on them was important and they showed convinced by the initiative but would like more visibility given to these kind of projects, using internet. (UoL re IS)

Certainly the novelty and freshness of certain initiatives greatly contributed to increase visibility and external appreciation. Yet, this very much depends, once again on available resources, notably funding to be allocated to specific communication plans. Building and keeping trust with all involved stakeholders also needs intense engagement and specific capacities and relational abilities that, once again, are at the core of the Science Shop personnel's professional competences.

Through pilots the local science shop and office gained good visibility among university personnel and also outside stakeholders. Opening up the variety of possible public engagement experiences seems to enhance greater visibility to science shops. As a general rule, EnRRICH showed as a good way to get in contact with new people and develop a good level of trustfulness. (UNISS re UoL)

And whereas communication is generally seen as a strategic activity and the related professional competences are highly valued, relational competences needed to build trust, provide safe learning environment and engage in responsible practices with all involved stakeholders are often less visible, valued and rewarded. A better recognition of those dimensions is therefore necessary in HEIs.

The project briefs were designed in collaboration with the partners. Opportunities for regular communication and feedback between the partner and students were built into the project design. The lecturer mentioned, he would like to consider an implementation plan – as part of the project design should the partner wish to proceed to implementation, at the beginning of the project. This plan would include practical, corporate and financial elements, and would build solid long term partnerships with VDK. (DIT re VDK)

Yet, once again, for activities to gain wider visibility extending their range and variety becomes important. As it has been seen, besides extra work, that also often requires privileging extension (i.e. activities open to larger numbers of participants) to intension (i.e. in
depth work with a limited number of participants) with potential detriment to the quality of the learning experience.

Certainly, from the institutions' point of view, the communication and dissemination work done around pilots was definitely positive for external and internal visibility of the institution's engagement with the public.

What's interesting about this, is there was a lot of top down support, the institute saw it as a real opportunity to promote university's engagement with the city. (DIT: meeting notes from peer evaluation focus group)

Several EnRRICH partners worked to promote activities, their roles and their results by organizing public reward ceremonies and celebrations. Projects were also presented through exhibitions, public events (of general public interest on issues of collective relevance) and largely visible events like hackathons. Besides visibility, those initiatives also often ensured larger dissemination of results and further learning outcomes which were attained both by sharing of learning and by involving students in the organization of events. Also the involvement of renowned CSOs partners in dissemination activities led to wider communication impact.

Among the features of this project, which contributed to make it a "huge success", was the final presentation. Helped in this task by the [for profit partner organization in pilot] expertise, the students realised the most professional output among all the projects. As a consequence, the dean has become aware of this successful experimentation, and she will support in the future the inclusion of social issues in the programmes. (UoL re CUB)

Processes underlying outcomes (how things are getting done)

Stakeholders’ involvement in activities

The Science Shop approach and experience was demonstrated as being very valuable in involving stakeholders in activities. Several pilots were built around existing relational networks with both lecturers and CSOs.

There are lots of CSOs submitting project ideas every week (VUB).

Interestingly, some pilots were conceived to move very significant parts of the activities outside the academy's walls. For instance, VUB organized open courses in non-university venues. The course is open to everyone for the evening guest lectures held in venues
outside VUB. During daytime sessions, only registered students work on their projects. CSOs are also involved in promoting the events. The existence of trustworthy and stable relationships with stakeholders that were built along time by Science Shops showed very relevant. Also, specific relational expertise and a clear role of mediating actors was crucial.

The CBR/problem based approach to learning ensured highest levels of participation by students. Therefore, strong commitment and motivation from all partners was generally observed. That is crucial, since, as said above, activities can be very resource consuming and all involved parties need to see their interest in participating.

Yet, it was also observed, not all stakeholders might be interested in participating in all activities. This is particularly true as to participation in planning and designing activities (see below). For instance, CSOs might be interested in just the output of the process, just like different levels of motivation influence the students’ engagement and, finally, their learning.

Pilots that were set in order to involve a larger number of students can be seen as effective as to education for society, rather than with society. Students’ interaction with societal stakeholders is in fact limited to presentation of results or formulation of demands. Yet, societal stakeholder seemed quite satisfied with results, although his participation in the whole process was limited. (UNISS re UoL)

Like for any participatory practice, a thorough understanding of the stakeholders' interests must be developed in order to ensure that each one of them finds a place and role in activities that are consistent with their interests and therefore motivations. Far from proposing a utilitarian approach, this means acknowledging that motivation of actors – and therefore the engagement springing from mobilization of resources – largely depends on their interests. Stakeholders’ interests and resources determine their involvement and mediating actors promoting participation – like Science Shops, in our case – need to identify and map them in order to be able to manage the process effectively.

It depends on the stakeholders, overall there is a willingness and an interest in collaboration, they see the benefits. Time is always an issue, to discuss things and to agree on things. (VUB re WU: excerpt from interview)

People are wary of agreeing to be an expert that the students can contact, in case they have to spend a lot of time responding to questions from students. Course coordinators didn’t want the CSOs to suggest real research questions (as Science Shop personnel had suggested), as they wanted to leave the students flexibility in deciding how they would proceed. (DIT re VUB)

Identifying and mapping stakeholders’ resources also means spotting and understanding power relations and unbalances among them, in order to provide safe learning spaces and prevent overloading, exploiting or excluding weaker actors (notably when working with vulnerable citizens).
Some stakeholders [may] see the students as cheap labour. (VUB re WU)

In some senses the situation that all stakeholders were working within was delicate, with strong discussions between CSO stakeholders from different backgrounds and having relatively different levels of power in their community. (QUB re UNISS)

CBR and real life learning experiences always imply a certain degree of risk, including failure. Involved actors must have this clear in mind and it’s mainly the mediating actor’s responsibility to ensure that that is rightly acknowledged. High levels of motivation along with a kind of involvement that touches upon different dimensions (mental, physical, interpersonal, sentimental) may engage actors very passionately, which may lead to disappointment or conflict. This was the case, for instance, in one of the CUB’s pilots.

One of the lessons of this trial is the commitment aspect: as confessed by one of the students and confirmed by the academic advisor, a project featuring a CSO requires an upload of work. It can also include more “passion” (students can be emotionally touched by the persons or the missions of the CSO), what can lead to conflict. This has been the case at a moment in this project.

The challenge here is to balance the involvement of students on the one hand, and CSO people on the other hand. Too much “excitation” from the students for the CSO mission or context (here the fight against homelessness in Hungary) can make them missing or neglecting the real needs of this CSO (here a search for sustainable business plan to develop the mobile housing activity with containers). In such a case, the CSO representatives can turn disappointed. (UoL re CUB)

Even when those issues are adequately dealt with, difficulties remains in managing participatory processes with too many actors involved. Number of involved actors, diversity of their interests, resources and time scales can make real participation difficult. Furthermore, it has been observed, growing organizational obligations make the issue even harder to manage, notably on the HEIs’ side. That is a challenge to process requirements that involve inclusiveness and diversity.

**Stakeholders’ involvement in process and method**

Actively involving stakeholders in process and method can be quite time consuming, notably for some kind of stakeholders that, as said above, might not have a particular interest in getting too far in discussing curriculum/course design, unless they are stakeholders with a particular interest in peculiar professional profiles. This is for instance the case at UNISS or at UCC, where pilots addressed social work profiles: structured professional association of social work are very eager, and often have an institutional mandate to watch over the training requirements and process for future associates professionals.

Yet, as a general rule, building on distinctive Science Shop approach, non university stakeholders were often involved in process rather than in method: notably from the very start, in the formulation of the research question(s) that would be at the centre of the learning
process. Practices can combine different forms and levels of participation. For instance, IS used a questionnaire to generate the key issues around which pilot would develop; VUB referred to the large number of research questions arising from CSOs collected by the Science Shop, etc.

There are lots of CSOs submitting project ideas every week, so [...] focus was on making the space in the curriculum for the projects more than involving the community in the design process – also the deadline was tight for getting the changes to the module validated. (DIT re VUB)

The design of the pilot totally emerged from a bottom-up approach: built-on an experienced network of 15 teachers from secondary schools, a survey was made to identify a topic. Among the 1000 students asked, a clear will (40% of respondents) to address the mental health issues (depression, suicide) appeared. The following design of the project (5 months-course with workshops, before an action with 3 master students of different disciplines. The responsiveness of the project (shaped upon their real needs) encouraged the engagement of young people and, following, the inclusiveness of the successive steps. (UoL re IS)

This kind of first approach could eventually evolve in more dialogical processes with CSOs and/or through the involvement of other stakeholders like students and/or lecturers: practices may vary depending on context and stakeholders’ motivations and resources.

Depending on the particular project, sometimes participation, some more informing – try to stimulate the students to move up on the ladder [refers to Arnstein’s ladder of participation]. (VUB re WU: excerpt from interview)

Whatever the specific solution that was finally adopted, the early involvement of stakeholders in crucial project management of the pilots as a generalized practice must be here pointed out as a distinctive feature of what we are here defining as Responsible Curricula/Course Design and Teaching. Once again, it is a matter of not overloading stakeholders with excessive burden and/or expectations, as well as avoiding possible confusion in roles.

Other stakeholders such as lecturers were of course central in designing courses, often by means of continuous reflexive exercise and exchange of ideas with Science Shop personnel (UoL). Systematic application of RRI process requirements is crucial: reflexivity often coupled with anticipation and responsiveness in order to ensure effective inclusion of different kind of stakeholders in the process.

Because of the flexibility of module design in the Italian system and the willingness of both the students and the CSO to trust the course leader, there was the possibility for students to be responsive to the needs of the CSO and for the CSO to take a strong role in designing and managing the project. There was also an opportunity to respond to the interests and needs of the students, which involved a significant degree of reflexivity on the part of the course leader as well as the students and CSO members. Students were offered the opportunity to express their needs and
interests which is less common in Italian higher education. Based on the student evaluations, whilst several enjoyed this, some also found it challenging. (QUB re UNISS)

One must not think of stakeholders’ active participation in the design phase as limited to the timescale of the pilot. As a matter of fact, structured as well as less structured forms of evaluation from students and community partners (like in VUB’s case, for instance) have been adopted in order to ensure continuous improvements and notably re-orient future course programming. Often, most significant forms of participation are developed over long time spans, thanks to collaboration in different activities which help build and consolidate common understandings, practices and approaches, along with mutual trust (UNISS).

The FOIST Laboratory where the EnRRICH project is based in the University of Sassari has a long history of working with communities and societal actors. During the evaluation meetings I could see the longstanding nature of some of the relationships between the FOIST lab and CSO representatives. (QUB re UNISS)

Often, the scientific communities and the academic institutions don’t recognize and value the often hidden work that is required to ensure the relational background that ensures effective participation and shared ownership of outreach activities. Cultural change is on its way in academia, yet still in need to be systematically pursued. Along with cultural change, institutional arrangements need to be worked out to ensure continuity of action through a honest and coherent public engagement approach and adequately recognized and valued professional practices and standards.

Involvement of stakeholders is resource intensive and time consuming.

In the case of the Graphic Design projects, the lecturers spoke with the students to get a sense of their interests and then approach partners based on these. This stage of the project set-up was very time consuming. In all of the projects, project briefs, milestones and communications plans were developed in collaboration between the lecturer and the partner. (DIT re VTDK)

Yet, it can also provide resources itself, notably when stakeholders act as sort of “multipliers”. Such is the case of pilots that involved senior students as learners and mentors (VECHTA o VTDSK), or promoted mutual learning among different stakeholders.

Having more stakeholders brought new learning. (CUB: meeting notes from peer evaluation focus group)

WU’s pilot involved CSOs in the process of grading students. Yet, this could generate discomfort in students.
Stakeholders also grade the students and this is on one side good but also creates a pressure on the student. (VUB re WU)

**Process requirements**

As already recalled above, the RRI Tool project identified four requirements that are needed for the research and innovation processes to be defined as responsible. They are anticipation, reflexivity, inclusiveness and responsiveness.

As said, observations recorded in peer evaluators’ reports and reflective exercises that were developed on the bases of the mutual learning prompted by peer evaluation activities (focus group and follow up collective conversations) lead to think that the EnRRICH project experience was distinctively marked by a generalized and systematic use of RRI process requirements at different stages and levels of the Consortium members work. That is a peculiar feature of the CBR/Science Shop approach that was used as a key to address the whole issue of embedding RRI in the curriculum. As to activities run in WP3 and WP4, in previous pages, we came as far as defining this systematic reference to RRI process requirements as RCDT – Responsible Curriculum/Course Design and Teaching. A better definition of the terms which compose this acronym as well as of the underlying concepts still need to be further developed, it was said. Yet, this tentative labelling can be at this stage used to refer to a general approach that was put to work at different levels by means of a systematic reference to and use of RRI process requirements at different stages of activities and different operational levels that were recalled upon as follows:

- Course design and management (inclusion, anticipation, reflexivity and responsiveness being embedded in the making and running of learning activities);
- Students’ experience (inclusion, anticipation, reflexivity and responsiveness being embedded in the learning practices experienced by students);
- Course content (inclusion, anticipation, reflexivity and responsiveness being one of the issues dealt with in the learning activity).

In other words, what we are here temporarily and tentatively labelling as RCDT – Responsible Curriculum/Course Design and Teaching is an approach that makes systematic use of RRI process requirements (inclusion, anticipation, reflexivity and responsiveness) in the design and contents of the learning experience, as well as in the funding pedagogical and didactical principles and practices of the training and teaching activities. Like in Heidegger’s hermeneutic cycle⁷, this logic introduces a new meta level of RRI process requirements at each step made climbing up the ladder of abstraction.

As said, at the lower level, the contents of the learning experience (what is being taught) process requirements are key concepts that apply to any ambit of responsible action, being that research, innovation or anything else. As such, they are of great interest to students in different discipline and are easily approachable from different points of view. They can realistically be dealt with by means of different didactic approaches and proved very much suitable with real life experiences like those based on a CBR/Science Shop approach. As a

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⁷ Heidegger 1927. As known, Gadamer (1960) further built on that idea, which brought Giddens (1990) to theorize that reflexivity, intended as an recursive circular process that implies a concatenation of different levels and meta-levels of reflection, can be seen as a distinctive trait of modern societies.
matter of fact, learning through CBR was often worked out as a way learning about RRI by means of RRI.

As a traditional feature in science shop projects, the frequent redefinition/reformulation of the initial problematic during the project course generates a positive outcome by the students: responsiveness, resilience, adaptation. (UoL re CUB)

At a higher level, much has been already said about the general approach to the learning experience and the inclusion of stakeholders at that stage as well as about the use of reflexive instruments to promote introspection and conversation needed to stimulate mutual learning. This implied great attention to students’ needs and attitudes. This can be particularly rewarding for students that develop a clear feeling that they are being taken seriously. Yet, as said, this implies high levels of openness and flexibility which challenges lecturers and requires time and effort. Also, the relatively high levels of incertitude may create a certain degree of discomfort in students.

The lecturer took a specific approach to the project. He spent time getting to know the students interests, and motivations and then decided on a suitable partners based on this, and approached potential partners to develop projects. The lecturer mentioned that each CBR/RRI pilot was different and each had its own set of challenges, and that is was important to remain flexible to changes as they emerged. (DIT re VDTK)

Students struggled a little with the open nature of the course and the new approach involved. Some identified appreciating the fact that the course ‘was not just sitting down and reading a powerpoint’. […]

Students were offered the opportunity to express their needs and interests which is less common in Italian higher education. Based on the student evaluations, whilst several enjoyed this, some also found it challenging. It should also be noted that after the first few sessions of the course, some students self-selected to leave the course since they did not feel ready for such an interactive educational experience. (QUB re UNISS)

Albeit demanding for all actors involved, several observations remarked the efficacy of this approach which is consistent with what in Deliverable D2.3. (p. 20) of the EnRRICH project has been defined as “emancipatory education"
The more the course is worked out progressively in a flexible and open way, the less a clear separation between the method and principles used to articulate work with students and the approach that was developed to design activities can be identified in actual practices. Reflexivity showed crucial both in managing learning activities as issued emerged (thus associated with responsiveness and adaptive change) and more on the long run while designing the course or evaluating activities done in order to introduce changes in new programmes (hence in association with anticipation).

Responsiveness was increased in semester 2 because they tried to match the students’ work with science shop project ideas on file. The redesign of the module also involved responsiveness and inclusiveness in aiming to include the partners more deeply. Anticipation is involved now in the redesign. Reflexivity is in the evaluation process and all the way through the process. (DIT re VUB)

[…] class pilot demanded for quite in depth questioning on the teacher's side as to the development of pedagogical approach and instruments as well as course contents. Teacher seemed to have been “forced” to a very serious and in depth thinking about how to work out her course: a real challenge that came from EnRRICH and need to try to embed RRI in the course. (UNISS re UoL)

In both those cases, collaboration between lecturers and Science Shop personnel was crucial to enhance the potentials of reflexive thinking, which is amplified when being practiced collectively.

**Longer term outcomes and possible future impacts**

During the duration of the project, it was of course not possible to directly witness the long term impacts of actions that have been undertaken. Yet, some first outcomes were observable and some considerations and inferences can be made at this stage on the bases of what was directly remarked during peer evaluation activities.
Learning outcomes

Much has already been said about the learning experiences that were developed and their contents. The strong reference to RRI process requirements through a problem based approach was certainly crucial for students to develop or reinforce their competence base as future responsible researchers and/or future professionals.

The problem based learning approach and community based learning also showed very functional in cultivating transversal professional and life skills.

The lecturer mentioned the pilots provided a good opportunity for students to develop important personal and professional development skills that could not be achieved in doing a theoretical version of the project without a partner. The benefits he mentioned include:

- Developed professional development skills like communication, project management, and time management
- Developed communication skills for engaging with the non-discipline specialist audiences
- Developed skills in understanding and meeting partner expectations
- Showed exemplifying commitment, motivation and drive to finish the project to a high standard because designs were being handed over to a partner.
- Understanding the importance of evaluating the project at various key stages
- Professional satisfaction when the partner actually used the designs. (DIT re VTDK)

More in general, students have often learned about the social value of their profession and how much research can be connected to societal needs.

As a student they got an idea of engagement and what transdisciplinary projects mean, as a citizen they can really see how research at university can affect citizens, local life and community. As a professional they also can go now from outside to the inside of university: if there is a question now in their work field they won't hesitate to go to university with it. (VUB re VECHTA)

The students mentioned from doing this pilot, they realised that there is a general perception that designers make things look nice and that design is easy to do. This was good learning, as it forced them to articulate the design process itself to non-designers in order from them to understand the various stages involved in a design project. Another significant piece of learning they mentioned they took away from this project, was the ability to side step their own personal style or design view point in order to meet the expectation of the partners. They mentioned that regular communication with the partner was crucial to keep them on track on this aspect of the project. (DIT re VTDK)

Students' exposure to courses or other experiences that introduce them to RRI or CBR or that embed some of the principles of public engagement have potential to show very positive as to their immediate future as students: they can be introduced and be sensitized to issues that lead them to develop further through a science shop project.
Working on a class project or hackathon that is conceived around a societal stakeholder’s needs and interests clearly impacts on how students can develop as citizens and persons. The peculiar emphasis that UoL’s class project put on professional development clearly sets good potential for impacting on students’ development as responsible professionals. (UNISS re UoL)

Students identified that they had changed as people during the process of undertaking this pilot. They made comments such as ‘ethically it will affect the way I’ll be interacting with more problematic areas in our urban space’ ‘I think this learning could change my approach to people’ ‘now I’m more interested in change I can do in my own city’ ‘I will take more care about what other persons think and say’ ‘[it] helped me to know how to act in different situations’. Some felt that it had built on their own personal qualities [...] (CUB re UNISS)

Those outcomes are clearly produced by the particular approach that is typical of Science Shop work with stakeholders and which is crucial in addressing some of the Dublin descriptors that are otherwise hard to be addressed through more classic learning paths. Pilots run within the EnRRICH project systematically added a collective dimension to the typical Science Shop learning experience and that seems to have brought added value to the fallouts of activities, notably thanks to enhanced transdisciplinarity and collective work.

As mentioned in the evaluation the students ranked the societal relevance of the module more highly after completing it. Some had very positive feedback about the course.

Its interdisciplinary aspects are unique, meeting students from other domains and backgrounds. They really enjoyed this, as it’s very unusual in VUB. It should help them to think outside their own boxes, taking into account the wide range of knowledge and opinions on an issue. (DIT re VUB)

That also connects to more material fallouts that are nonetheless irrelevant from the student’s point of view, nor from the institution’s point of view that is supposed to provide students with orientation and instruments to confront with the job market.

Bringing them in touch with local people who have direct experience of these issues, that students might not have. Makes them more realistic about life, more in touch with real life. Provides good networking opportunities. (DIT re VUB)

In addition to an insight into the consultancy work (what has confirmed the will of some students to work in this field), one of the learning has been how to manage a (fragile) relation with a client. [...] A possible impact by the new generations of students can be on the future choice of their employer, by including an assessment of the potential impact/value in the society. (UoL re CUB)

Some students go as far as mentioning the participation in the pilot as a valuable component in their curriculum vitae.
Stakeholders’ involvement

Much has been said above about stakeholders’ involvement in various activities and at different stages and levels of pilots. As said, this is a very resource intensive yet highly rewarding work.

Some stakeholders are committed on the very short term: such is the case for most students and some CSOs, as well as for some lecturers. Some others have already been there for a while and some are clearly willing to engage on the longer term. It is the case for students wanting to embark on a Science Shop project for their final dissertation after having coming into contact with public engagement.

It depends, very often there is a strong link and they come back to us with a new project so there is a relationship that we build, but sometimes it is just a one time relation. We are able to keep a good relation and interaction. [...] The students bring in something new, they develop the outcome. (VUB re WU: excerpt from interview)

Some students expressed their desire to also engage as mentors for other students in future activities and/or to go back to the partnering CSO some time later to verify the outcomes of their work. Also, some lecturers found participating in pilot activities very stimulating and want to further develop their experience new competences.

This pilot has shown a clear interest by the young citizens to participate to research priorities and governance. A long term increase in participation of civil society into policy making (in this case, it means an impact on the health agenda) could result of these kind of initiatives (if sustained and scaled up). (UoL re IS)

The co-ordinator of the pilots mentioned that being involved in this pilot has opened the door for VDK to engage in RRI/CBR projects. It is providing good context for examples of good practice to emerge in VDK. The next important piece of work will be to communicate internally the nature of these projects, and that this visibility may lead to other lecturers wanting to engage in this work, as well as communicating the good examples externally to partners in order to increase the supply of partners. There are plans already in place to do some of this work including students presenting their project internally during a design day at the college. (DIT re VDK)

As a general rule, it was widely observed that the running of pilots widened the number of stakeholders involved in activities if compared with prior experience of several EnRRICH partners. This was one of the explicit objectives of many pilots which showed quite fruitful achievements because the involvement of new and more numerous stakeholders implied a multiplication effect at several levels. New stakeholders means that new learning is potentially embedded in activities. Visibility also increases and public engagement and responsibility issues can be further shared and developed also with CSOs.

In fact, opening up to new kind of partners was interesting for the partners themselves, notably whereas partnership was open to less traditional stakeholders. For instance, as
already remarked above, CUB’s working with market oriented organizations made mutual learning on responsibility possible for the non academic stakeholders themselves.

The downside of this, once again, is the increase in resources that are needed in order to make it all possible. Also, a question arises as to sustainability, i.e. the limits beyond which an increase of the number of partners involved becomes counterproductive (see also below).

Organizational outcomes and impacts

Although this might produce changes beyond the duration of the programme, one might think that the several initiatives taken by partners at local level to expose academic and non-academic staff to seminars and workshop about RRI will result in some change in people’s behaviours but also eventually at a more structural level.

Most EnRRICH Consortium members remarked the fact that the very existence of the EnRRICH project strongly leveraged the visibility of the courses and the work of Science Shop like structures. This was particularly true for those Consortium members on their way to institutionalizing or consolidating a structured entity (IS, CUB, VTDK), whereas others have found activities profitable to scale up existing programmes through experimentation of new initiatives (UNISS, UoL). Of course, EU funding was crucial to legitimize Science Shops and public engagement activities within institutions.

In fact, institutions found out that the kind of activities promoted through the EnRRICH project are key to make their engagement with community visible. To the point that some EnRRICH Consortium members were able to successfully advocate for the up taking of public engagement in their institution’s strategic documents. Others were able to set promising basis for initiatives run through pilots and/or RRI related activities beyond their present operational range. Such is the case for UNISS, VUB and UCC, for instance, all eager to expand their activities beyond the social sciences domain.

More generally speaking, the involvement of new stakeholders through piloting and sharing competences and learning through dedicated seminars and workshops enabled many to expand their partnership base and initiate new possible organizational and operational paths.

[A lecturer at] WU (who is in close touch with RRI expert Jack Stilgoe) wants to start-up a responsible innovation centre and we are involved thanks to EnRRICH, they are trying to do this already a long time.

We are creating a mass of people that are working with RRI in a different way – some actors are more interested in the technological side or the philosophical side but also the practical side in terms of projects. More people are working in the RRI field from different sides and this creates a good mass of people that was increased by EnRRICH work. (VUB re WU)

More in general, pilots were a great opportunity for EnRRICH partners to experiment new ways of engaging with society and enlarging the type and quality of stakeholders involved in their activities. New ways of engaging with students beyond the classic Science Shop projects connected to final dissertation were widely experimented through systematic use of problem based and CBR project in courses or dedicated modules. Larger initiatives also occurred through hackathons (UoL) and involvement of school pupils (IS). That was surely
challenging and has opened the way to operational change. Thus, it can be expected that that will most probably lead to organizational change as well. Possibly, those changes will occur beyond the strict number of EnRRICH Consortium members, to invest the wider ambi of the Living Knowledge Network and the Science Shops community. It would be desirable that future SWAFS projects will build on this experience and consolidate it.

Organizational change needs augmented effort and resource investment to ensure the necessary promotion, prompt the start-up phase and ensure sustainability. Whilst the first two were possible through EU funding of the EnRRICH project, the third needs further prerequisites to be ensured.

One of those conditions that it was possible to observe at work during the duration of the EnRRICH project was the alignment of favourable conditions at different levels: in the policy context, as well as at institutional and intra-organizational levels. That clearly emerged from evaluation of experience at UCC. When EnRRICH project started, CARL (Community-academic Research Links, UCC Science Shop structure) had been in existence for some years and was running a limited number of Science Shop projects every year. This was mainly due to the fact that many relevant aspects of work were to a large extent on the shoulders of academic staff. Thanks to EnRRICH funding new personnel was contracted to take over some of the organizational and relational work needed to increase the time available for strategic thinking and working. In particular, through the work of WP3, EnRRICH personnel were able to raise awareness of UCC CARL across the university and provide the small, part-time CARL team with new insights in relation to gaps and opportunities for the Science Shop. The EnRRICH project helped to bolster and somewhat energise CARL activities because EnRRICH staff were part of a wide and active Science Shop network and were able to apply these learnings to the plans and ambitions of CARL. This was amplified by a favourable national and institutional policy context. In fact, following chapter 5 of the National Strategy for Higher Education 2030 and subsequent landscape policy documents, Irish higher education institutions have adopted the Campus Engage Charter for civic and community engagement. With this foundation, UCC were favourable positioned to engage in a strategy consistent with the Charters principles. Given that context and with timely EU funding of a project conjugating RRI and piloting new learning activities, CARL was the right actor in the right place at the right time. This fact gave large visibility to EnRRICH activities, leveraged the experience and role of CARL as a Science Shop, and opened up new promising perspectives at all levels with new funding, new projects, new disciplinary areas being addressed, and a continuing contribution to the national public engagement field (since CARL personnel won prices and was called up to write texts for relevant dissemination materials to promote and consolidate the Campus Engage programme nation wide).

**Sustainability and continuity of action**

Sustainability and continuity of action are the big challenge for many partners to keep beyond the EnRRICH project. As said before, the very existence of EU funding was very relevant for all and crucial for some to consolidate and/or get new developments on their way.

The co-ordinator of the pilots mentioned that being involved in this pilot has opened the door for VDTK to engage in RRI/CBR projects. It is providing good context for examples of good practice to emerge in VDTK. The next important piece of work will be to communicate internally the nature of these projects,
and that this visibility may lead to other lecturers wanting to engage in this work, as well as communicating the good examples externally to partners in order to increase the supply of partners. There are plans already in place to do some of this work including students presenting their project internally during a design day at the college. The lecturer mentioned that other project ideas emerging during the project with the partners that were beyond the scope of what the students could achieve in these project, these will be new ideas for other students to work on and will maintain an ongoing partnership with the partners. (DIT re VTDK)

The course leader also carried out interviews as part of EnRRICH and it seemed there was a wider interest in RRI in the University of Sassari and a potential for widening this agenda within the university as part of the changes that were already taking place. A PhD workshop also took place involving the evaluator and a member of the EnRRICH Advisory Board and whilst this is not directly being evaluated here, it seemed that PhD students were interested in, and also struggling with, the issues raised by RRI in their day to day research (although they would not have referred to the problems as RRI, rather they were coming from experiences). It seems there is an appetite for developing and embedding of RRI at both practice and policy levels. (QUB re UNISS)

Most EnRRICH Consortium members plan to consolidate some of the most successful pilots, eventually introducing changes consistent with evaluation.

Module will start again in summer term and we’re working on a workshop to promote RRI to them and participatory research and how to include it in their research. We’re trying to get the younger ones because the older ones are more reserved, we’re trying to change it from bottom-up.

[…] We’ll need to find new partners to make it interesting for students. (VUB re VECHTA: excerpt from interview)

There is also a potential for the course lead to take the learning from this course and embed it in an evaluation course which he anticipates running in the next year. (QUB re UNISS)

We hope to offer the course again next year. […] Not doing just pilots, we are creating something that we want to embed and strengthen. […] Maybe we could create a programme with the WU mass that is working on these projects? (VUB re WU: excerpts from interview)

In 2017, a second pilot project of the same dimension and similar approach is planned: in line with Irsi Caixa core topics, the issues proposed to the same network of secondary schools teachers will this time focus on HIV/AIDS, with a special attention on the prevention aspects. The anticipation will probably be at the centre of the process. (UoL re IS)

Sustainability over time is very context dependent and is generally connected with the possibility of ensuring the extra resources that were needed to widen the range of already existing activities run by EnRRICH Consortium members. As said above, often, EnRRICH project and related initiatives were a good leverage to promote Science Shops structures, their approach and activities at institutional level, thanks to increased visibility and good feedback from stakeholders.
If this trial may have triggered some concern before launching it (due to a previous unsuccessful project including an NGO), the back-up provided by [external partner organization in pilot] has brought enough guarantee.

As a consequence of the successful ending of this project (presentation), the Dean has become aware of this experimentation, and she will support in the future the inclusion of social issues in the programmes. (UoL re CUB)

Further visibility and some rewarding will reinforce sustainability in the future. Yet, mobilization of resources remains crucial.

In this pilot, the support from senior management was crucial to get the pilot up and running. Senior management then asked the Dean of the College to select the lecturers to get involved in CBR projects. On completion of the CBR projects, all outcomes will then be sent to senior management and some financial award may be made at that point to lecturers. The lecturer mentioned the following would assist the development of these projects in VTDK moving forward:

- Support with finding, communicating with and co-operating with partners
- Support with internal and external communication of the projects
- Support with evaluation of projects
- Funding for materials
- Hours made available in timetable
- Support with developing implementation plans for projects with partner. (DIT re VTDK)

The challenge and class mode pilots look more like an add-on activity to “normal” science shop activity: therefore, a greater effort is needed to ensure continuity. Sustainability in that direction could be ensured thanks to increased visibility and the connected possibility to leverage at UoL policy level on increased numbers of students involved in activities. (UNISS re UoL)

Of course, what has been said above about the relevance of a positive alignment of favourable factors at the national policy, institutional and intra-organizational levels remains crucial also as to sustainability and continuity of actions.

Yet, in the course of evaluation group discussion among EnRRICH Consortium partners, many underlined also the relevance of human factor. Personal motivation and engagement along with charisma and relational/operational competences of some people were said to be crucial. Notably in the early stages, it was observed, “champions” are a very important resource. But depending on champions over time becomes problematic, because continuity is excessively dependent on individuals. Rather, the need is there for a strategy and course of action to draw on individual “championship” for structural institutional change. In order to do so mutual mentoring and support at different levels and among different kind of actors was said to be crucial. According to EnRRICH Consortium members, WP4 activities along with WP6 peer evaluation proved relevant to that respect. Also a sort of a natural mentoring system among students, lecturers, community partners was observed and supported in several cases.
In order to be able to do so, the experiences observed within the EnRRICH project show that the existence of a core set of coherent activities consistent with a specific approach (here public engagement) along with organizational capacity based on specific professional competences (here Science Shop like structures) provide for the necessary platform upon which new programmes, projects and actions can be piloted and consolidated. The mobilization of resources needed to get those new initiatives running and sustainable can be reduced by scaling up pre-existing ones. The core role and associated competences and peculiar approach of Science Shop like organizations in being mediators between academia and community partners were crucial for the designing and managing of the pilots for the teaching of RRI by means of an RRI approach (here tentatively named RCDT – Responsible Curriculum/Course Design and Teaching).
Acknowledgements

This report builds on contributions made by many EnRRICH Consortium and Advisory Board members. We would like to thank all EnRRICH partners that acted as peer evaluators and evaluatees, along with their colleagues, students, CSOs and other stakeholders that were willing to take part in this mutual learning exercise.
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Annexes
Annex 1.
List of EnRRICH Consortium members and corresponding acronyms

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Annex 2.

EnRRICH

Enhancing Responsible Research and Innovation through Curricula in Higher Education

POSSIBLE INDICATORS FOR EVALUATION ACTIVITIES

The following set of indicators has been identified on the basis of brainstorming activities at EnRRICH' first Consortium meeting in July 2015 in Cambridge.

Keywords and suggestions were marked by brainstorm participants on post-its. UNISS synthesized them and then grouped them in homogeneous clusters as from the following table.

This draft is open for discussion. Once a general consensus is reached, indicators will be weighted as to their relevance to process and results (by means of a Scale of Obliged Priorities) and will thereafter be used as basis for formative evaluation (mentoring visits and focus groups).

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| Study levels                               |                                                                                   |
### Outcomes

#### Learning outcomes

(Study level(s) interested by pilots: under/post graduate)

(Study level(s) interested by pilots: under/post graduate)

#### Organizational outcomes

(Structuring of single courses and curricular architecture)

#### Profile of science shops and courses

(Which profile have and acquire the science shops and courses involved)

### Impacts

#### Trustfulness and visibility

(Within academia and with stakeholders)

#### Organizational impacts

(Impacts of pilots in the way organization is structured and works)

#### Sustainability and continuity of action

(Sustainability of the project and its continuity in future: maintaining curriculum best practices for a long time, etc.)
Annex 3.

EnRRICH

Enhancing Responsible Research and Innovation through Curricula in Higher Education

RANKING INDICATORS FOR PEER EVALUATION ACTIVITIES

During kick off meeting in Cambridge, EnRRICH partners were asked to brainstorm about criteria useful for peer evaluation of activities run under WP3 and WP4.

Ideas were collected through post-it and then grouped by UNISS into 17 sets of indicators. Such indicators have been printed on 17 cards that you will use to rank them along two different dimensions: process and results.

1. PROCESSES

Task 1 of WP6 concerns formative evaluation of WP3 and WP4 and provides for the following:

1.1 Formative (learning) evaluation of best practices and bottlenecks in WP3 and WP4:
1.1.1 Peer evaluation and mentoring visits to partners involved in WP 3 and WP4 by expert partners or advisory board members. Visits (months 12-18) aim at stimulating reflexive evaluation and monitoring participation in projects including by discipline and by gender. These visits will coincide as much as possible with consortium meetings, swap shops or other mentoring visits in the frame of WP3/WP4 or - if necessary- will take place through skype, online interviews and questionnaires. Therefore, travel expenses for visits will be reduced to a limited number and are foreseen in the partners travel budgets.
1.1.2 Peer evaluators will produce a short semi-structured report including observations, recommendations and metrics.

Please, place the cards on the attached Scale 1 (Processes) in order to rank indicators as to their importance for peer evaluation of how partners are working out activities carried out within WP3 and WP4 (0 = least important; 16 = most important).

2. RESULTS

In addition to what has been reminded above, task 1 of WP6 also provided for the following:
1.3 Utilizing peer evaluation to review student competencies and learning outcomes developed in WP2 and produce brief guidelines to support the embedding and implementation of RRI competences in curricula (Months 18-30).

1.3.1 Coordinate peer evaluation to identify what competencies were shown as a result of the approaches used in WP3 and WP4 and identifying any blockages to their development.
1.3.2 Review competencies identified in WP2 in light of practical experiences and peer evaluation.

Please, place the cards on the attached Scale 2 (Results) in order to rank indicators as to their importance for peer evaluation of results obtained by partners by means of activities carried out within WP3 and WP4 (0 = least important; 16 = most important).
### 1. Processes

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2. RESULTS

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## ATTACHMENT 1: REMINDER OF INDICATORS

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<td>(Public engagement, governance, science education, ethics, open access, gender)</td>
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<td>Process Requirements</td>
<td>PROREQ</td>
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<td></td>
<td>(Diversity and inclusion, anticipation and reflection, openness and transparency, responsiveness and adaptive change)</td>
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<td>Stakeholders' involvement in planning</td>
<td>INVPLAN</td>
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# ATTACHMENT 2: INDICATORS CARDS

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(Which profile have and acquire the science shops and courses involved) | PSS |
|-------------------------------------------------|-----|
| **Trustfulness and visibility**  
(Within academia and with stakeholders) | TRUVIS |
| **Organizational impacts**  
(Impacts of pilots in the way organization is structured and works) | ORGIMP |
| **Sustainability and continuity of action**  
(Sustainability of the project and its continuity in future: maintaining curriculum best practices for a long time, etc.) | SUSTCONT |
Annex 4.

EnRRICH
Enhancing Responsible Research and Innovation through Curricula in Higher Education

WP6 Evaluation: Learning, stakeholder accountability, approaches

**Task 1.1. Formative evaluation of WP3 and WP4**

**Report on first round of peer evaluation activities**

**January 2017**

<table>
<thead>
<tr>
<th>Peer evaluator:</th>
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<td>Evaluated partner:</td>
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**Brief description of peer evaluation activities (with dates) so far**

Please, point out at least two main bottlenecks emerging from peer evaluation

Please, point out at least two main positive observations emerging from peer evaluation
Planned future peer evaluation activities

Please, point out any difficulty you have encountered in using the peer evaluation tool, and/or any issue/suggestion you might want to discuss during WP6 activities at Consortium meeting in Barcelona

Done at........... on (date)...........
Annex 5.

EnRRICH

Enhancing Responsible Research and Innovation through Curricula in Higher Education

WP6 Evaluation: Learning, stakeholder accountability, approaches
Task 1.1. Formative evaluation of WP3 and WP4

Guiding tool for peer evaluation activities (interviews, observation, focus groups)

DOA REMINDER

Task 1.1 of WP6 provides for Formative (learning) evaluation of best practices and bottlenecks in WP3 and WP4. In order to do so, the following subtasks are provided for in EnRRICH DoA:

1.1.1 Peer evaluation and mentoring visits to partners involved in WP 3 and WP4 by expert partners or advisory board members. Visits aim at stimulating reflexive evaluation and monitoring participation in projects including by discipline and by gender. These visits will coincide as much as possible with consortium meetings, swap shops or other mentoring visits in the frame of WP3/WP4 or - if necessary- will take place through skype, online interviews and questionnaires. Therefore, travel expenses for visits will be reduced to a limited number and are foreseen in the partners travel budgets.

1.1.2 Peer evaluators will produce a short semi-structured report including observations, recommendations and metrics. Mainly partners participating in WP6 will act as "peer evaluators"; although other project participants involved in WP3/WP4 with relevant experience and skills shall eventually be asked to act as peer evaluator/mentor. Therefore, main budgetary implications of having peer evaluators concern Direct personnel costs of partners involved in WP6. Minor personnel costs might eventually be allocated within PMs of other pax involved in WP3 and WP4. Single reports will be collated into a synthetic report that will serve as an introduction and support material for running focus groups (step 3).
ABOUT THIS GUIDING TOOL

This tool was conceived to be used as a reference document useful for peer evaluation of activities run within WP3 and WP4 of the EnRRICH project.

Since the overall architecture of the EnRRICH project provides for strict connections between WP3 and 4 and WP2, a great deal of the work that led to the definition of this guiding tool builds upon Deliverable 2.3. “The EnRRICH tool for educators: (Re-)Designing curricula in higher education from a “Responsible Research and Innovation” perspective”, by Valentina Tassone and Hansje Eppink. A second relevant reference text used for developing this tool was Deliverable 1.3. of the RRI Tools project, titled “Report on the quality criteria of Good Practice Standards in RRI”. When possible and relevant, specific pages of those two documents are indicated as a possible resource for peer evaluators to elaborate a common understanding of issues at stake.

As a general rule, peer evaluators might find useful going through those two documents before and during peer evaluation activities.

ABOUT USING THIS GUIDING TOOL

Peer evaluation of activities in EnRRICH is conceived mainly for learning purposes. Thus, the role of the peer evaluator can be conceived as one of promoter and facilitator of a reflexive exercise to be shared as much as possible among people taking part in pilots conceived and realized within the framework of WP3 and WP4 of the EnRRICH project.

This tool has been conceived to be used in the most flexible way by peer evaluators. It is not a protocol nor is it a binding list of questions. Rather, it contains hints that are considered useful while carrying out interviews, conducting observation, talking with a group of people or running a focus group.

Building of previous collective activities run with EnRRICH partners to identify possible evaluation indicators and criteria, the guiding tool is divided in three main sections completed by a record card where main pilot facts can be registered. The three sections concern homogenous clusters of criteria concerning: 1. Current outcomes; 2. Processes underlying current outcomes (how things are getting done); 3. Longer term outcomes and possible future impacts. The sequence of sections and issues listed in this tool is not rigid nor binding. That means that, for instance in running interviews, peer evaluators shall not feel obliged to adopt a fixed order in organizing discussions. Rather, the chronological order of arguments will develop according to the specific situation and inherent interview logic. Some overlapping between issues dealt with in different sections are possible.

This organization of themes will be kept for reports that peer evaluators will have to produce concerning their analysis and observations. The structure and contents of this tool will serve as a guide for report writing: under each section, peer evaluators
will have to sum up 1) main observations and 2) main learning resulting from peer evaluation activities.

In the tool, each cluster of criteria is briefly introduced by a short explicatory note. For each evaluation sub-section, a main objective is identified along with one or more possible kick-starter and a series of potential issues. The kick-starters have been conceived as possible way to stimulate reflection about the issue, often by means of reference to concrete examples or stories in order for accounts not to become too abstract. Issues are suggested in form of bullet point list as a reminder of topics peer evaluators might want to discuss or observe. The lists of bullet points are not to be considered as binding as to their formulation and wording. Nor should one feel obliged to deepen all items or to propose them in a fixed order. Rather, the peer evaluator should act as a catalyst that facilitates a free flow of thoughts of interviewees by means of indirect probing questions aimed at stimulating further insight (such as “Hmm... I see...”; “What were you thinking at (or did you mean) when you were talking about...”).

The last part of this document presents a simplified version of the tool which is made up only of the kick-starters per section/issue. Some peer evaluators might want to use to this “lighter” version of the tool in actual practice and in situations that require referring to a more agile instrument.

**Who evaluates whom**

According to previous consultations, peer evaluation activities shall be organised as follows:

<table>
<thead>
<tr>
<th>VUB</th>
<th>evaluates</th>
<th>VECHTA</th>
<th>and</th>
<th>WU</th>
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</thead>
<tbody>
<tr>
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<td>evaluates</td>
<td>UNISS</td>
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<td>UNISS</td>
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<td>UCC</td>
<td>and</td>
<td>Lyon</td>
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<td>DIT</td>
<td>evaluates</td>
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<td>CUB</td>
<td>and</td>
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SECTION 1: CURRENT OUTCOMES

This section includes evaluation criteria focused on the defining main outcomes of the RRI pilots in terms of curricula (program or module) design, students learning and competences acquired by students. Here we are mainly interested in learning about the effects and results of our activities and actions.

1. Curricula design

Key objective  To learn about how curricula design connects to societal actors and their needs

You might want to reflect upon  Education for society. Design curricula that allow students to understand and address societal challenges

- Underlying purpose of the pilot
- Relevance of topics addressed for society
- Societal challenges directly or indirectly addressed

Education with society. Design curricula that engage students with societal actors

- Interplay between academia and society
- Science shop approach to curriculum design
- Collaboration to address grand challenges: among students, with societal actors
- Specific pedagogies or learning activities used to engage students with societal actors
- Involvement of societal actors in pilot and related activities

Possible kick-starter(s)  When we design a curriculum, whether for a whole degree programme or for a particular unit, we make plans for taking students in an intellectual ‘journey’ through a series of learning experiences. Can you tell me how you worked out such a planning for your pilot?

Resources for peer evaluators  D.2.3.: pages 9-14
1.2. Embedding

**Key objective**
To learn about ways to embed RRI related activities in curricula design

**You might want to reflect upon**

**Embedding in the participants’ experience**
- Pilot activities and what participants usually do
- Extra work to run pilot (teaching, training, working)
- Embedding of experience in participants’ personal and professional development
- Impact of participation in pilot on ordinary activities/daily work
- Impact of participation in pilot on general approach to ordinary work

**Embedding of pilot in study programme**
- Connections between pilot and other disciplines/courses taught in study programme
- Relation of pilot to strategic goals of the Department or University
- Any relationship to national policies

**Possible kick-starter(s)**
Can you describe the process of embedding the pilot in previously existing activities and curriculum provision?

Thinking back to the pilot design, development and/or implementation, were there particular moments when you thought something like “This just is not going to fit”, or “This does not have anything to do with what I am supposed to be doing”?

**Resources for peer evaluators**
1.2. Students’ learning

**Key objective**
To learn about the learning experience of students and the competences they acquired

**You might want to reflect upon**

**General aims of pilot**
- Underlying purposes of the pilot
- Inclusion of an education for society standpoint
- Kind of topics addressed within pilot
- Relevance of topics for society
- Societal challenges directly or indirectly addressed

**Competences acquired by students**
- Main knowledge competences (i.e. savoirs, cognitive competences, conceptual, abstract knowledge)
- Main skills (i.e. savoir faire, functional competences, being able to do things, ability to apply conceptual competences in actual situations)
- Main attitudes (i.e. savoir être, social competences, professional attitudes and behaviours, ability to assess and select a strategy and method)

**Articulation of learning outcomes**
- How were competences acquired by students
- Education approach (instrumental vs. emancipatory approach)
- Approach to education *with* society (light or deep approach)
- Learning activities used in the course of the pilot (e.g. role play, group discussion, project work, excursion etc.)?
- Different dimensions of learning (cognitive, affective, psycho-motor)
Possible kick-starter(s) Can you tell me a story or give me actual examples of significant changes you have observed in students’ attitudes, knowledge or skills after participating in the pilot activities?

Use the RRI competence framework scheme (below) to go through discussion about students learning in the pilot.

Resources for peer evaluators General aims of pilot: Reflective questions p. 11 D.2.3.

Students’ competences: pp. 15-18 of D.2.3

Articulation of learning outcomes: pp. 19-23 of D.2.3. In particular, reference scheme “Domains of learning for articulating learning outcomes” (p. 22) (see below)

Reference scheme in EnRRICH D.2.3.: RRI competence framework (p. 16)
Reference scheme in EnRRICH D.2.3.: Domains of learning for articulating learning outcomes (p. 22)
1.3. Trustfulness and visibility

**Key objective** To learn about how we dealt with communication and visibility of our activities

**You might want to reflect upon** Processes

- Dealing with sensitive data
- Building trust among involved participants
- Making the project visible
- Specific factors (issues, developments and/or endorsements) which contributed or could contribute to increase trust and visibility

**Involvement**

- Actors informed/involved in the different stages of pilot design and implementation
- Actors not informed/involved in the different stages of pilot design and implementation
- Main reasons for involving or not involving somebody in the project
- Feelings of involved/not involved people
- Main aspects or RRI that raised curiosity of people involved
- Main aspects of EnRRICH that raised curiosity of people involved
- Potential interest of people involved in pilot to go for another try
- Creation of a sort of micro RRI community in university

**Openness and transparency**

- Are all objectives, aims and goals honestly and clearly represented?
- Transparency of financial means/expenditure?
- Declaration of interests and affiliations of actors involved
- Representation and explanation of methods
- Existence and accessibility of policies on open access and information sharing
- Clarity of explanation of the exact role of actors in both the deliberative and decision-making process
• Feedback on how the input of different actors is used or what the impact of their input was in the practice
• Sharing of preliminary, intermediate and final results with all actors involved and/or affected?
• Identification and sharing of uncertainties in and limitations of the proposed practice
• Clarity about ownership and accountability, not only of positive, but also of negative outcomes and impacts

Possible kick-starter(s)  Can you tell me how you managed communication about the project and how were different stakeholders involved

SECTION 2: PROCESS UNDERLYING CURRENT OUTCOMES (HOW THINGS ARE GETTING DONE)

This section includes evaluation criteria which enhance reflection about current outcomes and processes underlying the outcomes you indicated when you went through Section 1.

Here we want to discuss issues that are relevant as to how things are getting done.

2.1. Stakeholders’ involvement in activities

Key objective To learn about how we went in terms of education for and with society

You might want to reflect upon Involvement of stakeholders in general

- CSOs involved in activities and to what degree
- Particular activities in which different stakeholders played a different role
- Most interesting contributions brought about by stakeholders
- Potential stakeholders that did not participate to activities. Why didn’t they?
- Possible differences in the perception that different participants have about stakeholders’ participation and role
- Institution’s role in facilitating (or not) an interplay between academia and society
- Time needed to enhance stakeholders’ participation
- Assessment of different stakeholders’ expectations
- Activities run to to see if stakeholders’ expectations were met
- Desirable changes in number and type of stakeholders involved in pilot
- Range and diversity of stakeholders
- Range and diversity of values and of types of knowledge/expertise brought about by stakeholders (i.e., experiential knowledge, scientific knowledge)
- Activities and strategies to make all relevant voices heard (silent as well as loud)
- Diversity within the stakeholder groups involved in terms of gender, ethnicity, class, age and other demographics
- Methods and techniques used for engaging specific stakeholder groups in dialogue
Specific contribution of stakeholders

- Stakeholders contribution to defining pilot design and learning outcomes
- Stakeholders contribution to implementation of activities
- Stakeholders contribution to the assessment of results
- Effects of stakeholders’ contribution

Possible kick-starter(s)

Can you tell me something about the relationships with the stakeholders. Who were they? And how did the relationship between students, educator(s) and societal actors work out?

Use Arnstein’s ladder of citizen participation (1969: figure below) to discuss about stakeholders’ participation in activities.

Think back to your experience. Can you list three positive and three negative aspects about stakeholders’ participation in this pilot?

What went well when engaging stakeholders (students, educators, societal actors) in societal challenges and in the pilot? And what could have been done differently? What could have been done differently? What were strengths and bottlenecks?

Resources for peer evaluators

Involvement of stakeholders in general: pp. 11-14 of D.2.3 (education with society).
Arnstein’s ladder of citizen participation (1969)
2.2. Stakeholders’ involvement in process and method

(This session could build on previous one, notably focusing on stakeholders’ involvement in active roles designing and managing the pilot)

Key objective To learn about curricula design for and with society

You might want to reflect upon

- Who participated in pilot design? How did that work?
- Light or deep approach to education with society?
- Who took decisions needed to manage the pilot? How did this happen?
- Situations in which stakeholders’ participation was not possible
- Situations in which stakeholders’ participation was not desirable
- Feelings of CSOs and students about their involvement in the pilot
- Ideal approach and method to promote participation
- Possible changes of perception of the stakeholders’ role and degree of involvement over time
- Stakeholders involved in the definition of learning outcomes
- When were relevant stakeholders involved
- Stakeholders’ commitment and interest
- Stakeholders’ empowerment through pilot

Possible kick-starter(s) Not all stakeholders like or have time to be involved in all aspects of a project, just as different project leaders have different positions about how and to what degree stakeholders should be called to take part in crucial choices. What was your experience in involving stakeholders in designing this pilot both as to outcomes and method?

Resources for peer evaluators Reference scheme in EnRRICH D.2.3.: “Defining who articulates learning outcomes” (below)
Reference scheme in EnRRICH D.2.3.: Defining who articulates learning outcomes (p. 20)
2.3. Process requirements

Key objective  To look back at the process of designing and implementing the pilot and to analyse in what way and to what extent the process dimensions of anticipation, reflexivity, inclusiveness and responsiveness were taken into account when developing and running the pilot.

You might want to reflect upon  
- How and to what extent anticipation aspects were taken into account when designing and implementing the pilot.
- Same for reflexivity.
- Same for inclusiveness.
- Same for responsiveness.

Possible kick-starter(s)  Anticipation, reflexivity, responsiveness and inclusiveness have been looked at before as learning outcomes. Think back of the process of designing and implementing the pilot: do you think those requirements applied to your own experience? How?

SECTION 3: LONGER TERM OUTCOMES AND POSSIBLE FUTURE IMPACTS

This section includes outcomes and impacts that are unlikely to be produced in the life course of pilots. But you may want to try to figure whether conditions are there for those effects to take place in the future (are they taken into consideration in setting pilots? Are they likely to happen?). Typically, you should consider medium and long term effects on organization, but also stimulate reflection about sustainability and continuity of initiatives undertaken under EnRRICH.

3.1. Learning outcomes

Key objective To imagine possible medium and long term effects upon students’ future as a citizen, a person and a professional

You might want to reflect upon Effects on students

- Possible effects of what students learned through pilot in their future experience in university
- Same as citizens
- Same as persons
- Same as professionals

Indirect outcomes

- Foreseeable learning outcomes of pilot that it would be interesting to reproduce in and/or extend to other courses/educational activities in your organization
- Societal challenges directly or indirectly addressed in pilot

Possible kick-starter(s) Try to think to a specific student that was involved in the pilot and try to imagine how what he/she learned will affect his/her future life as a student, as a citizen and person and as a professional. What do you see?

Resources for peer evaluators
3.2. Stakeholders’ involvement

**Key objective**  
To imagine possible medium and long term effects upon relationship with main stakeholders (can be related to previous homologue section)

**You might want to reflect upon**
- Future strengthening of relations with stakeholders involved in pilot
- Future strengthening of stakeholders’ capacity in project design and planning
- Future evolution of common understanding of each others’ values, ways of thinking, functionings, languages etc.
- Quality of cooperation in the future
- Possible future changes when considering stakeholders’ involvement on the base experience in pilots

**Possible kick-starter(s)**  
Try to imagine the stakeholders that were involved in pilot within a few years from now. What will happen to them? How do you think the relationship you have with them will be like?

**Resources for peer evaluators**
3.3. Organizational outcomes and impacts

Key objective  To imagine possible medium and long term effects upon organization

You might want to reflect upon Organizational outcomes
- Most relevant learning about own organization out of this pilot experience
- Possible future influence of pilot experience on organization or courses/educational activities
- Compatibility of pilot with the future design of your curricula
- Possibility of people taking up new tasks as a result of their implication in pilots

Organizational impacts
- Possible effects of experience upon participation in Livingknowledge activities
- Organizational levels in own institution that will be most affected by taking part in EnRRICH
- Contribution of pilot experience to Higher Education Institution public engagement
- Possible effects of pilots’ activities in the way science shop operates
- Possible changes of way of teaching and doing research after taking part in pilots by teachers involved

Possible kick-starter(s)
Organizational outcomes
Name the top three challenges to stimulating positive organizational change the pilot led to or might lead to. And try to rank them in order of difficulty to overcome.

Do you think that this experience with pilot will change anything in the way your course/department/university works?
Organizational impacts

Think about your organization within three years and how you think it will work then: do you think anything about participating in EnRRICH will have contributed to such a change?

Does the institution (and related strategic policies and plans) supports the pilot? And in what way? What can be done further to embed or scale up the pilot

Resources for peer evaluators
3.4. Sustainability and continuity of action

**Key objective**  
To imagine how the activities done will evolve in the future and how continuity of action can be ensured

**You might want to reflect upon**
- Activities that will be kept in the future
- How this could be supported
- Possible or desirable further future developments
- Future of Science shop in own institution
- Organization’s readiness to adapt trainings to the RRI requirements?
- Possibility of institutionalizing pilot experience
- Pilot’s usefulness in conquering new people to the cause of Science shops

**Possible kick-starter(s)**
What do you imagine as a follow-up to this work next academic year?

Could the project be repeated or replicated? Do you think that would need significant changes?

**Resources for peer evaluators**
**RECORD CARD**

**Key facts about pilot**

Name of peer evaluator(s)
Name of evaluated EnRRICH partner

Who was involved in peer evaluation activities?
When were information gathered? And how?

Which disciplines and topics have been involved in pilot?
(If applicable) What were the interactions among disciplines involved in pilot?

How many educators were involved in pilot?
How many students were involved in pilot?
How many CSO members were involved in pilot?
Other people involved in pilot (type and number)

Which study course(s) was/were involved in pilot?
If applicable, point out eventual interactions among them.

Study level interested by pilot (BA, MA, PhD, other)

RRI keys mainly addressed by pilot (Governance, Public engagement, Gender equality, Science education, Open access/open science, Ethics, Sustainability, Social justice/inclusion)

RRI process requirements mainly addressed by pilot (Anticipation, Reflexivity, Inclusiveness, Responsiveness)
SECTION 1: CURRENT OUTCOMES

1. Curricula design

- When we design a curriculum, whether for a whole degree programme or for a particular unit, we make plans for taking students in an intellectual ‘journey’ through a series of learning experiences. Can you tell me how you worked out such a planning for your pilot?

1.2. Embedding

- Can you describe the process of embedding the pilot in previously existing activities and curriculum provision?
- Thinking back to the pilot design, development and/or implementation, were there particular moments when you thought something like “This just is not going to fit”, or “This does not have anything to do with what I am supposed to be doing”?

1.2. Students’ learning

- Can you tell me a story or give me actual examples of significant changes you have observed in students’ attitudes, knowledge or skills after participating in the pilot activities?
- Use the RRI competence framework scheme to go through discussion about students learning in the pilot.

1.3. Trustfulness and visibility

- Can you tell me how you managed communication about the project and how were different stakeholders involved
SECTION 2: PROCESS UNDERLYING CURRENT OUTCOMES (HOW THINGS ARE GETTING DONE)

2.1. Stakeholders’ involvement in activities

- Can you tell me something about the relationships with the stakeholders. Who were they? And how did the relationship between students, educator(s) and societal actors work out?
- Use Arnstein’s ladder of citizen participation to discuss about stakeholders’ participation in activities.
- Think back to your experience. Can you list three positive and three negative aspects about stakeholders’ participation in this pilot?
- What went well when engaging stakeholders (students, educators, societal actors) in societal challenges and in the pilot? And what could have been done differently? What could have been done differently? What were strengths and bottlenecks?

2.2. Stakeholders’ involvement in process and method

- Not all stakeholders like or have time to be involved in all aspects of a project, just as different project leaders have different positions about how and to what degree stakeholders should be called to take part in crucial choices. What was your experience in involving stakeholders in designing this pilot both as to outcomes and method?

2.3. Process requirements

- Anticipation, reflexivity, responsiveness and inclusiveness have been looked at before as learning outcomes. Think back of the process of designing and implementing the pilot: do you think those requirements applied to your own experience? How?
SECTION 3: LONGER TERM OUTCOMES AND POSSIBLE FUTURE IMPACTS

3.1. Learning outcomes

- Try to think to a specific student that was involved in the pilot and try to imagine how what he/she learned will affect his/her future life as a student, as a citizen and person and as a professional. What do you see?

3.2. Stakeholders’ involvement

- Try to imagine the stakeholders that were involved in pilot within a few years from now. What will happen to them? How do you think the relationship you have with them will be like?

3.3. Organizational outcomes and impacts

Organizational outcomes

- Name the top three challenges to stimulating positive organizational change the pilot led to or might lead to. And try to rank them in order of difficulty to overcome.
- Do you think that this experience with pilot will change anything in the way your course/department/university works?

Organizational impacts

- Think about your organization within three years and how you think it will work then: do you think anything about participating in EnRRICH will have contributed to such a change?
- Does the institution (and related strategic policies and plans) supports the pilot? And in what way? What can be done further to embed or scale up the pilot

3.4. Sustainability and continuity of action

- What do you imagine as a follow-up to this work next academic year?
- Could the project be repeated or replicated? Do you think that would need significant changes?