



D6.3 Lessons learned and main recommendations emerging from evaluation activities of the EnRRICH project

Final WP6 Report

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INTRODUCTION

This Deliverable summarizes the learning outcomes of formative evaluation activities run within the EnRRICH Project (Work Package 6, Task 1). Its contents are also based on relevant inputs emerging from summative evaluation and discussion with stakeholders for evaluating RRI embedding in Higher Education Institutions' curricula (Work Package 6, Tasks 2 and 3).

The objectives of evaluation of the EnRRICH project were two-folded: 1) systematically learn from activities carried out by consortium members (formative evaluation: Task 1 of WP6) and 2) accountability (summative evaluation: Task 2 of WP6). According to what was initially provided for within the project's Description of Action, summative evaluation was subcontracted to a third party (CUPP – Community University Partnership Programme, University of Brighton, UK) which has acted independently, yet in constant connection with WP leader (UNISS) and project coordinator (VUB) and vice-coordinator (QUB). The results of summative evaluation are presented in a specific report.

This deliverable is conceived to synthetically present the main lessons learned throughout the EnRRICH project. It will then point out some of the main challenges to embedding RRI in the Higher Education curriculum and proposes recommendations emerging from lessons learned.

Most empirical evidence supporting the claims in this deliverable has been already extensively presented in Deliverable D6.1. Further analytical advancements were developed through focus groups with peer evaluators and Consortium members.

RATIONALE AND METHOD

A constructivist approach. Formative evaluation of the EnRRICH Project is based on a constructivist approach to evaluation research (also known as fourth generation evaluation) which aims at understanding the evaluatees' experiences by incorporating different ways of building and sharing knowledge, along with diverse epistemologies and relevance criteria [1]. That approach has been considered consistent with the very nature and role of the evaluatee (highly diversified as to operational contexts and courses of action to be observed) and the main objectives of the evaluation exercise: formative evaluation. [2, 3] "Formative evaluation is evaluation designed, done, and intended to support the process of improvement, and normally commissioned or done by, and delivered to, someone who can make improvements." [4, p. 20]

Evaluation criteria and procedures were identified by means of direct involvement of stakeholders and evaluatees through a stakeholders' workshop and evaluatees' brainstorming and prioritization. Empirical evidence was then collected through peer evaluation based on non standard, in depth, research techniques such as unstructured and semi-structured interviews, focus groups, analysis of documents, participant observation. Methodological issues and related techniques are presented and discussed more thoroughly in Deliverable D6.1. They have been also presented at conferences¹ and in a peer reviewed publication. [5]

¹ International Conference on Responsible Research and Innovation in Science, Innovation and Society. RRI-SIS 2017 (Rome, Sept. 25-26 2017); Engage 2016 (Bristol, Nov. 29-30 2016).

RER – Responsible Evaluation Research. Adopting a constructivist approach was considered as highly congruent with a comprehensive Responsible Research and Innovation (RRI) approach. In order to be defined as “responsible”, a research process has to fulfil requirements as outlined by Kupper et alii. [6] Table 1 schematically recalls the main RRI process requirements and indicates the major related strategies and techniques adopted within the EnRRICH formative evaluation exercise which we therefore define as Responsible Evaluation Research (RER).

Table. 1. EnRRICH evaluation as Responsible Evaluation Research (RER)

RRI Process Requirements	EnRRICH evaluation strategy	Relevant techniques
Diversity and inclusion	Early involvement of stakeholders and evaluatees in the research process (including definition of evaluation criteria and strategy)	Brainstorming Scale of Obligated Priorities Workshop
Anticipation and reflection	Systematic use of reflexive practices along with practices of inclusive deliberation	Focus groups
Responsiveness and adaptive change	Promoting change through incorporation of emerging knowledge and learning in practices. Flexible methodology	Focus groups Unstructured and semi-structured interviews Participant observation
Openness and transparency	Updated communication on on-going results to evaluatees	Periodic reporting to partners and Advisory Board

MAIN LESSONS EMERGING FROM ENRRICH FORMATIVE EVALUATION

The following pages synthetically present the main lessons learned from evaluation activities run within the EnRRICH project.

1. Students

Community based and problem based learning. Students enjoyed working their learning through a problem based approach which showed the most useful and effective while dealing with such abstract issues as “responsibility” and related theoretical corpus. Engaging in real world situations directly presented the, with the complexity of issues at stake and showed direct implications of different courses of action and thinking styles. In certain cases this profoundly challenged their habitual way of looking at things: while that fact reinforced the learning process and promoted effective change, in certain cases it was observed to be somehow overwhelming for certain students who felt excessively uneasy being out of their comfort zone.

Collaboration and learning across disciplinary boundaries was also perceived as highly positive and enabled the acquisition of transversal competences. Peer learning and mutual support prompted valuable learning outcomes through motivation and involvement. Confronted with real world situations students had to make connections across disciplines and learn about themselves not only as researchers or innovators, but more widely as persons, citizens and future professionals with social responsibilities. Collaborative work in real world learning experiences often also allowed for power, conflict and inequality issues to be dealt with appropriately. Yet, in depth work in this direction needs time, which is not always compatible with structure of courses and often strict and rigid academic schedules (see below): pressure for students to rapidly gain credits contributes to the sharpening of that problem.

2. Teaching

Teaching RRI Process Requirements. Most of the EnRRICH pilots aimed at fostering students’ competences on RRI Process Requirements (PR), rather than RRI keys (public engagement, gender equality, open access, ethics, governance, science education), which identify the EU’s policy agenda to address the Science With and For Society objective through RRI. Learning about PR was generally seen by teachers and students as pertinent to a responsible approach to professional practice, be it research intensive or not. RRI keys showed more abstract from actual experience and interests sometimes of both students and teachers. Learning PRs therefore proved useful beyond the sole research and innovation domains demonstrating their usefulness to a wider formative experience for responsible professionals and citizens. Specific teaching tools and strategies have been developed and tested by EnRRICH partners in order to foster PR learning. They are openly available through the EnRRICH website. Yet, sharing those strategies was not always easy. Specific planning and more resources would have been necessary in the EnRRICH project to ensure a more effective exchange of practices among consortium members and beyond.

Using RRI Process Requirements. Some pilots went as far as incorporating PRs in the learning process itself. For instance, regular use of learning journals prompted students reflexivity about their own learning experience, thus fostering new strides towards increased learning capacities. Adoption of learner centred pedagogical approaches along with active interaction with community partners implied high degrees of diversity and inclusion and demanded responsiveness and adaptive change. Openness and transparency showed key to a learning process aimed at emancipatory education through co-development of learning outcomes. Involvement of students in real world situations engendered the above. PRs were especially useful whereas Community Based Learning (CBL) strategies were adopted and furthermore requested whereas pilots implied the direct involvement of students in Community Based Research (CBR) experiences.

Community Based Learning and Community Based Research experiences were much appreciated by students. Yet, the setting up of those kinds of learning situations requires high levels of trust and a clear and fair agreement with community partners as well as the creation of safe and equitable learning circumstances for students and community partners alike. Optimal conditions to ensure those requirements to be fully met were not always present. That required mediation and adaptive change. Pre-existing trust relationships showed crucial in that respect. Hence, the need for relevant anticipation and relational capacity. Combining different time scales (the institution's, the students', the community partners') also was a difficult task. Academic agenda is hardly compatible with the needs and opportunities arising from external stakeholders: excessive organizational and institutional rigidity can lead to misencounters and can put truly equitable partnership at risk. Reciprocal agendas' adjustments is part of the equilibrium in power relations and organizational flexibility is therefore needed to ensure margins for setting a negotiated agenda. Embedding CBL/CBR within long term courses or articulating them through enchainment of modular activities proved useful to address that issue. Yet, that required relevant efforts and often complex organizational arrangements which often go beyond one single teacher's capacity (see below: Institutionalizing RRI in curriculum). Breaking down a complex societal issue or a long duration CBR project into smaller coordinated learning units, activities or tasks also enabled active involvement of students at different levels.

Grand Societal Challenges (GSCs) and Sustainable Development Goals (SDGs). In order to ensure coordination and coherence of learning activities, modules and programmes, taking on EU's GSCs and/or UN's SDGs proved particularly useful. Anchoring the learning process to wide and yet well identified matters helped frame the problem based approach and enabled connections between local experiences and global issues, thus reinforcing students' sense of effectiveness. Wide reframing of issues also enabled cross-fertilization across disciplines and transdisciplinary approaches to real world concerns. Problem based learning through involvement of students in real life situations favoured cultivation of transversal professional and life skills, along with concrete reference to responsibilities attached to a profession and its connections with societal needs.

3. Planning and managing of RRI in curriculum

A great **diversity of strategies and solutions** in planning and managing the embedding of RRI in the curriculum was observed in the EnRRICH project partners' experiences emerging from different combinations of top-down/bottom-up and light/deep approaches which were actually put in place depending on existing norms and regulations, institutional and organizational frame, operational

capacity, yet within the wider framework provided for by the EnRRICH Tool for educators (see Deliverable 2. 3).

Light and deep approach. As a general rule, that variety of options was observed ranging between two different modes that can respectively be referred to as light and deep approaches. A light approach typically implies the involvement of larger numbers of students, for a generally short time in intensive experiences. An example of that approach is given by hackathons, which allow for the exposure of many students to alternative forms of learning experiences and usually ensure high visibility, but generally don't leave much room for cultivating depth of relationships and engagement and for articulating the learning experience. A light approach was observed to be useful for a first exposure to RRI. Yet, the agreement with partners and external stakeholders should be clear about the actual transformative potential of the kind of activities that are possible under a light approach in order to avoid disillusion and frustration in all involved actors. Typically, a deep approach is aimed at small groups of students or individual learning experiences such as in Science Shops projects typically take the form of nearly one-to-one teacher-student relationships and ask for a strong mutual engagement with community partners. This kind of activities can produce relevant impacts on all involved stakeholders, but are very resource intensive and normally concern smaller numbers of students vis-à-vis those mobilized by a light approach.

Top-down and bottom-up approaches. The choice between a light or deep approach often depends on several factors. In the EnRRICH experience the choice was connected to the curriculum level: light exposures to engagement activities were more frequently practiced with undergraduate students, whereas postgraduates were more frequently involved in in-depth experiences. Also, actual viability of institutional arrangements played a relevant role, in combination with main aims of the learning experience. Community partners' demands and expectations also showed relevant, yet to a minor extent than the previous factors. That seemed to be happening when community partners are sort of driven onto activities rather than act as drivers.

Use of RRI Process Requirements in planning and managing the embedding of RRI in curriculum was often a common feature within that variety of experiences. As a general rule, bottom-up deep approaches implied more significant up take of RRI PRs rather than top-down light approaches. Systematic implementation of PRs required intense use of resources, involvement of limited numbers of students and strong engagement. That ensured relevant impacts on all actors involved (students, teachers, community partners) along with a shared sense or responsibility. Yet, this goes against the institutional pressure to reach larger numbers of students and ensure visibility of initiatives. In fact, less intensive adoption of PRs typically allowed for resources to be allocated to involvement of larger numbers of students and higher visibility of initiatives, yet were generally associated with lower levels of engagement of actors involved and mainly affected academic actors rather than community partners.

4. Institutionalizing RRI in curriculum

Tri-focussed approach to change. Real change was observed to be happening where actions addressed persons, institution and community. In order to do so, strategy to institutionalize RRI in curriculum needed be based on a clear theory of change, supported by contextual enablers, provided with adequate human capacity and structural facilities. A tri-focussed approach to change was also observed building on combination of universities' three missions: teaching, research and service.

Excessive emphasis on single missions and related pressure on structures and individuals (e.g. “publish or perish”) was observed as steering actors’ conducts with potential negative effects on overall impacts.

Theory of change: emancipation. Responsibility is based on autonomy which derives from emancipation and empowerment of actors. Learning emancipatory processes were observed to be promoting autonomy in students. Equal partnership and mutual recognition were observed to be promoting involved actors’ empowerment through cooperation as well as effective impacts on people, community, institutions. The EnRRICH experience shows that in order to ensure sustainability of processes and durability of impacts, some conditions are needed at system level.

Contextual enablers: combining and aligning. A great variety of strategies to embed RRI in curriculum was observed to be taking place, mainly depending on actual context specific possibilities. Success or failure of solutions that were locally worked out and adopted largely depended on the possibility that EnRRICH partners had to combine the different factors and resources to hand rather than on specific factors themselves. Whereas the possibility/ability to creatively combine factors was not present, difficulties were harder to overcome and eventually led to failure or to a strong limitation of achievements. According to the notion of “adjacent possible”, strengthening combinatory potential favours innovation and triggers change opportunities [7].

Furthermore, success was observed whereas combinatory capacity coupled with alignment of favourable conditions: positive alignment of national policies with institutional strategies and operational facilities and capacity enabled rapid progress and effective results. Also, intra-institutional alignment among boundary spanners (see below) was observed to be effective.

Contextual enablers: regulatory flexibility and stability. Excessive rigidity of regulatory systems (overruling, heavy bureaucratization and excessive formalization of procedures) was observed to seriously hinder the combinatory capacity and thus hampered effective impact. Regulatory systems need to be clear and simple to allow flexibility. They also need to be stable: rapidly changing regulations were observed to produce turbulent operational environments which fettered cooperative programming and action and did not allow for slow steady processes to articulate their full potential. Continuity was seriously endangered by regulatory instability.

Contextual enablers: Permanent Partnership Instruments. Cooperative projects or activities were observed to be often resource intensive, yet sometimes limited in time and scope, which can be frustrating for actors involved, notwithstanding project reaching its objectives. Engagement and stakeholders' involvement are keys to RRI and require time and human resources to build trust and equitable partnership among actors, to develop and share objectives and procedures through cooperation.

A particular strategy to optimize resources and ensure sustainability and continuity was developed by some EnRRICH partners who worked out what can be defined as Permanent Partnership Instruments (PPI). PPIs are forms of agreement or collaboration plans that are conceived to set a strategic and operational framework to mutually engage partners beyond the life span of a specific activity or project. Community-university consortia, joint ventures for the common good or project platforms are examples of PPIs. A participated project platform was worked out by an EnRRICH partner with community members and local institutions and CSOs by setting an overarching and long term neighbourhood transformation strategy with identified objectives and action lines to be

pursued by local partnering actors over time through eventually independent yet coordinated projects.

Asymmetries were observed amongst actors involved in pilots: PPIs shall notably be structured as to possibly provide for weaker partners (often community partners and CSOs) to have direct access to resources (funding, infrastructural facilities), in order to balance power relations and thus effectively build equitable partnerships. Competitive environments don't seem as the best options in order for this to happen.

Contextual enablers: incentives and support. It is a truism to state that the very existence of the EnRRICH project enabled partners to pursue their plans. Yet, all partners insisted on the relevance of EU funding in providing policy and conceptual framework, along with economic resources, legitimation and credibility. In certain cases, the EU's legitimation and funding was crucial to overcome resistance to change and institutional inertia. The RRI option is based on social and ethical values. This has been observed to eventually contrast with an entrepreneurial approach to higher education institutions' governance where choices are primarily driven primarily by monetary value.

Excessively relying upon externally funded and time-bound projects may endanger effectiveness and continuity of actions and initiatives. It is clear that institutional strategy and/or policy provisions are needed to incentivize and support widespread embedding of RRI in curriculum in a systematic way.

RRI and engaged scholarship were observed to unequally apply to different disciplines and subjects. This implied diverse possibilities for the actual up take of RRI by different researchers and/or teachers. A clear implication of this is the need for support and incentive measures to be based on specific procedural standards and impact indicators.

Structural facilities: knowledge brokers and boundary spanners. Actors involved in teaching and learning activities often came from different backgrounds which implied different cultures, languages, and understanding of situations. They were also moved by diverse interests, needs and value frames. Involvement of stakeholders, students' tutoring in CBL/CBR activities, teachers' work in planning and running learning experiences often through collaboration with different disciplines required expert knowledge brokering and adequate operational/organizational infrastructure. "Knowledge brokerage can reside in individuals or structures" [8] which act to link the users and producers of research and can go as far as facilitating co-production of knowledge.

Science shops were observed to act as such a kind of organization: their relational expertise and capital played a key role in ensuring active involvement of different actors in all phases of the learning process. Their role was also crucial in establishing equitable partnership: the process was facilitated when Science shops could build on long lasting and already existing trust relationships with CSOs and community partners. They acted as "boundary spanners" insofar as they established bridges "between an organization and its exchange partners" [9].

As boundary spanners Science shops can be seen as a key element of strategies aimed at building community-campus sustainable connections [10]. According to evidence emerging from EnRRICH evaluation, Science shops can have a crucial role in a wider boundary spanning typology liable to favour community-university partnership. According to Weerts and Sandmann [11], boundary spanners between community and university can perform different roles depending on task orientations (technical, practical, socio-emotional, leadership) and on their position vis-à-vis community or university (Figure 1).

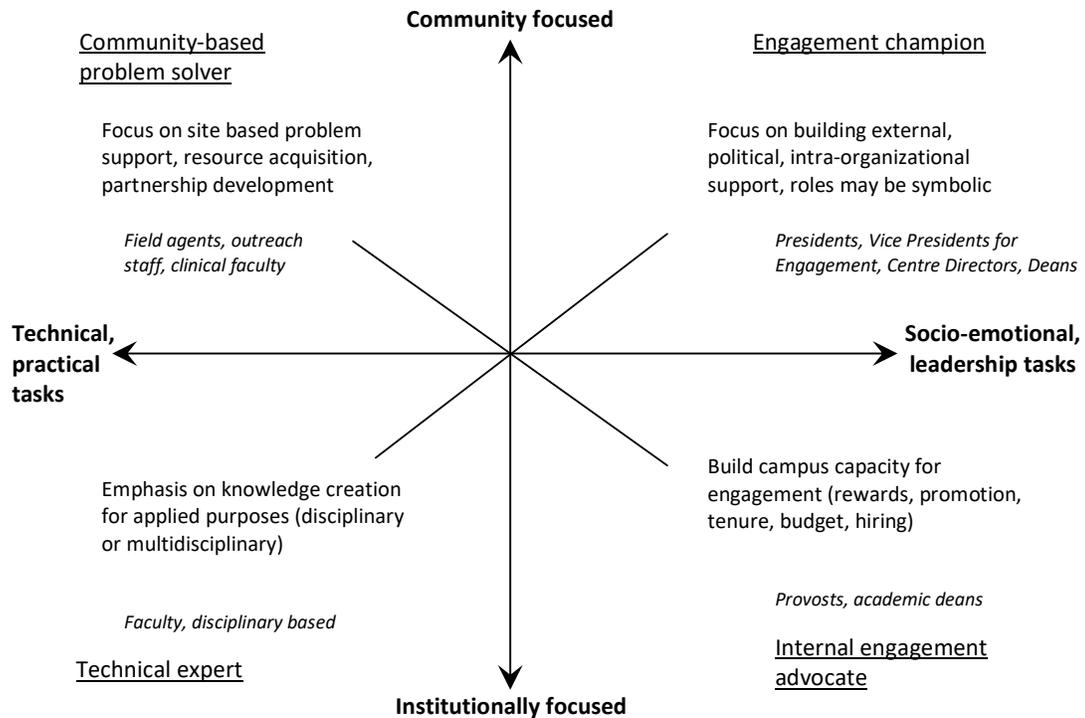


Figure 1. University-community engagement boundary-spanning roles at public research universities (source: Weerts-Sandmann 2010: 651)

According to our evidence, Science shops can be generally located in the upper-left quadrant of Weerts and Sandmann's diagram. Yet, beyond Science shops' position in that typology, EnRRICH evidence also shows that best results can be achieved when a strategic and operational alignment exists among different boundary spanners at work within and around an institution.

Furthermore, as Meza-Guarneros and Martins argue [12], boundary spanners can play a crucial role in building bridges not only among organizations, but also within organizations (Figure 2). Such was observed to be the case in the EnRRICH experience, when Science shops' work favoured also intra-organizational cooperation.

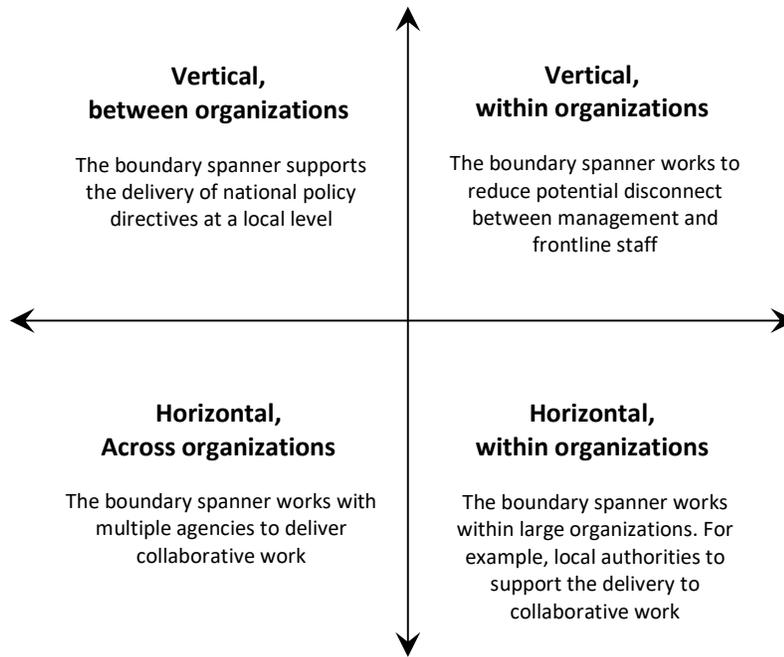


Figure. 2. Examples of boundary spanning activities (source: Sinclair 2017: p. 14 [13])

Structural facilities: organizational life cycle. New Science shops were observed to approach strategic development issues, sustainability and continuity of their initiatives in a very different way from more established organizational forms. This basic observation has relevant consequences and must therefore be recalled because different planning and management strategies are needed depending on an organization's specific life-cycle stage. Furthermore, the organization life-cycle was observed to often cross with the personal/professional life-cycle of the people that work in those organizations: the often limited size of public engagement units or Science shops and likewise units within or outside academia make them extremely fragile. As a consequence, organizations should systematically address recruiting, training and team building as core strategic activities for such kinds of organizations.

Human capacity: the motivation of people involved was deemed as crucial for the success of pilot activities. Different actors were willing to participate depending on specific interests that must be acknowledged and cannot be taken for granted. Students, researchers and teachers, as well as community partners, were generally interested in the emancipatory nature of proposed activities. Adhesion to a peculiar set of values was generally observed to be the first motivation factor. Practical and instrumental motivations were also observed to be relevant, yet to a less extent.

That evidence is consistent with literature discussing empirical research on main drivers and motivations leading to engaged scholarship. According to O'Meara [14], engaged scholarship is mainly driven by personal, intrinsic motivation that deal with the desire to facilitate students' growth, consolidate personal and professional identity and foster personal commitment to social issues, places and people. Similarly, Colbeck and Weaver observed that "the overwhelming majority of goals" engaged scholars identified as drivers for what they do "were easily categorized as integrative social relationship goals, which serve to maintain or promote other people or social groups" [15: p. 16]. Beyond those personal drivers, also structural factors play a role in engaged

scholarship: Bauer and Jensen analysis leads to the conclusion that “senior researchers are three to four times more likely to engage with the public than their juniors; and those who do mainly research are 55 per cent less likely to engage the public than those who do research and also teach” [16: p. 6]. Seniority as a robust predictor of both engagement and engagement intensity is confirmed by several studies [17], just like other research did not find significant association between engagement and academic career success rates or scientific productivity [18]. Although based on kind of observations and analytic postures than those adopted in the EnRRICH evaluation, that kind of evidence is consistent with the conclusion that motivation of engaged scholarship is largely based on personal drivers. Yet, this must not lead to infer that institutional context plays a minor role in promoting engaged scholarship. On the contrary, EnRRICH evidence shows that contextual factors play a major role in maximising or inhibiting such personal impulse. Which is once again consistent with what is evidenced by cited studies [14; 15] and more [19].

Therefore, it must be concluded that incentives are necessary to promote engagement, especially among early stage researchers/teachers, in order to foster a more widespread up take of RRI in both research and teaching. Moreover, supporting provisions and facilities are equally if not more needed for that purpose, in order to promote engaged practices in both teaching and learning.

Human capacity: professional skills. Knowledge brokerage and boundary spanning require specific competences and skills which showed crucial for EnRRICH pilots to work properly and eventually succeed. Activities aimed at fostering a community of practice within Work Package 4 of the EnRRICH project played a crucial role in reinforcing and sharing competences among consortium members. Among observed relevant competences for this kind of work some are worth mentioning notably given consistency with research evidence which recalls “the boundary spanner as network manager; the importance of building effective personal relationships with a wide range of other actors; the ability to manage in non-hierarchical decision environments through negotiation and brokering; and performing the role of ‘policy entrepreneur’ to connect problems to solutions, and mobilize resources and effort in the search for successful outcomes” [19: p. 121].

Those are competences not normally demanded from researchers/teachers: rather, they identify a specific professional profile which institutional policies and strategies might think worth investing on in terms of job appointments based on a clear job description, attached to specific training and career tracks.

5. A global responsibility framework for embedding RRI in the curriculum

It was stated above, but it is worth recalling that, where applied, systematically adopting RRI Process Requirements at all levels of the EnRRICH pilots (as learning input/content, in teaching methodology, in planning and management of learning experiences) was observed to be highly effective: internal coherence of the overall process and consistency with theoretical premises fostered positive outcomes of activities.

MAIN CHALLENGES

Main challenges to embedding RRI in Higher Education through curricula were faced by EnRRICH consortium members and others were observed notably through activities run in WP5 on policy. Some of which can be hereby recalled.

A competitive and turbulent environment does not favour the general up taking of RRI by universities. Growing pressure for so called “measurable” productivity of teaching and research also plays a negative role.

Instability of regulations, norms, institutional and organizational infrastructure puts continuity of initiatives that often rely on a delicate equilibrium.

In fact, public engagement units like Science shops are very fragile, often depending on both internal and external factors. Internal fragility factors are connected to small size of units and reliance on few highly skilled and motivated personnel. External fragility factors depend on all the above as well as upon power struggles and unbalances within universities.

Equal partnership with community stakeholders is often hard to reach and needs to be systematically addressed through clearly defined and strategically oriented modes of action.

A more widespread reference than in the past to RRI and related concepts and practices is observed both among researchers and institutions as well as in policies. Yet, a more widespread RRI culture still needs to gain momentum. The emergence of new terms and concepts in theory and policies may not favour the needed sedimentation.

RRI and engaged research and teaching are still far from becoming mainstream, rather, they are pursued and practiced by a small minority. Specific policies, notably at European level, are still strongly needed. In that respect, the very existence of the SWAFS – Science With and For Society unit within DG Research has shown crucial and will still be for some time.

RECOMMENDATIONS

1. For teachers

RRI Process Requirements should be included in RRI course or module syllabus.

RRI PRs should also inform teaching methodology as well as planning and managing learning experiences.

Practice Based Learning should be sought through direct involvement of students in Community Based Research activities, possibly explicitly connected to Sustainable Development Goals and/or Grand Societal Challenges.

Learning experiences outside of comfort zones should be sought, provided that appropriate measures are taken to ensure graduality, as well as adequate support, guidance and tutoring.

2. For institutions

Institutional policies should encourage and support the adoption of a global Responsibility framework in teaching as well as research practices, notably through promotion of RRI PRs.

Pursue consistency between teaching RRI and promoting RRI in research, institutional governance and strategic actions.

Institutional regulations should aim at facilitating and promoting processes, and avoid over-regulation.

Incentives for engaged scholarship should be provided (connected to evaluation based on specific operational standards and impact indicators) along with supporting measures which include RRI/engagement in institutional strategic documents and mission statements, dedicated operational provisions and structures, partnership and project support.

Organizational and procedural flexibility shall be sought in connection with institutional/regulatory/operational stability. Responsibility is directly connected to autonomy.

Provide for organizational capacity that can act as boundary spanner.

Build capacity and ensure continuity through appointments based on a clear job description, attached to specific training and career tracks.

Promote and support the elaboration and finalization of Permanent Partnership Instruments to ensure equitable and sustainable community-university cooperation.

3. For policy makers

Dedicated policy measures are needed to provide support, visibility and legitimacy.

Support and incentive measures should acknowledge the great variety of ways for conducting relevant research and provide for specific provisions, rather than pursue one-size-fits-all solutions. Policy shall identify specific relevance criteria and clearly connect them with different performance standards and impact indicators.

Promote and ensure regulatory alignment among different levels (European, national, regional, institutional).

Promote and ensure access to funding for community partners with special concern for less organized and weaker ones.

Foster responsibility through valorisation and promotion of professional and institutional autonomy.

Generalize the RRI approach to promote responsibility to areas beyond research and innovation, such as, for instance, corporate responsibility or responsible citizenship.

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