

# D 6.1 Strategy for the development of supplementary trainer guide and new training materials and tools

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Project title: BEYOND BAD APPLES: Towards a Behavioral and Evidence-Based Approach to Promote Research Ethics and Research Integrity in Europe

Project acronym: BEYOND

Grant agreement no.: 101094714

Lead contractor for this deliverable: EUREC

## Deliverable Factsheet

<b>Project Number</b>	101094714
<b>Project Acronym</b>	BEYOND
<b>Project Title</b>	BEYOND BAD APPLES: Towards a Behavioral and Evidence-Based Approach to Promote Research Ethics and Research Integrity in Europe
<b>Title of Deliverable</b>	D6.1 Strategy for the development of supplementary trainer guide and new training materials and tools
<b>Work Package</b>	WP 6
<b>Due Date of Deliverable</b>	M10 -31.10.2023
<b>Actual Date of Submission</b>	26.10.2023
<b>Deliverable Lead Partner</b>	EUREC
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## Revision history

VERSION	DATE	Revised by	Reason
0.1	28/06/2023	Tom Lindemann, Lisa Tambornino, Carly Seedall (EUREC)	EUREC internal review
0.2	25/09/2023	Maura Hiney, Susanne van den Hooff	Pre-submission review
1.0	26/10/2023	Rosemarie Bernabe	Final review

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5.	Partner	Oslo Metropolitan University	OsloMet	Norway
6.	Partner	Finnish National Board on Research Integrity TENK	TENK	Finland
7.	Partner	University of Central Lancashire-Cyprus	UCLanCY	Cyprus
8.	Partner	University of Helsinki	UH	Finland
9.	Partner	University of Humanistic Studies	UHS	The Netherlands
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## 1 Introduction

### 1.1 Abbreviations

RI	Research integrity
RE	Research ethics
RM	Research misconduct
FFP	Fabrication, falsification, plagiarism
QRPs	Questionable research practices
EC	European Commission

### 1.2 About BEYOND

BEYOND is a research project that aims to promote research ethics and integrity (RE/RI) and prevent research misconduct (RM) by adopting a complex ecosystemic perspective on the issue. The project will explore the existing literature on behavioural ethics and moral psychology, as well as the socio-economic consequences of research misconduct, and engage all involved stakeholders in public consultation. To guide and equip all stakeholders in the research ecosystem, BEYOND will utilise this knowledge to develop psychologically informed contextual interventions and methodologies to measure the impact of RE/RI training materials, a best practice manual and guidelines, and new training materials and tools. The project will mobilise all stakeholders involved in the consortium and the stakeholder advisory board to ensure widespread dissemination of results and facilitate their institutional uptake and embedding. By reinforcing efforts to promote adherence to the highest standards of research ethics and integrity, BEYOND aims to contribute to public trust in science and support the development of a strong research culture that is conducive to ethical research practices.

The project aims to explore and advance individual and institutional responsibilities in promoting RE/RI and preventing RM. To achieve this goal, the consortium will develop measures that are co-created, needs- and case-based, streamlined, and based on best practices. These measures will be designed to engage, advise, and equip research-related stakeholders through guidance and educational instruments. By doing so, the project aims to contribute to the development of a research culture that is conducive to ethical and rigorous research practices and that fosters public trust in science.

### 1.3 About this deliverable

Deliverable 6.1 provides the strategy for developing supplementary trainer guides and new training materials and tools. The strategy will identify and analyse existing training materials and tools for RE/RI education and map them in relation to the foci of BEYOND. The aim is to identify gaps in existing training materials and tools with regard to the utilisation of insights from empirical and behavioural research in ethics education and psychology. The mapping will focus on materials developed by other EC-funded initiatives (e.g., VIRT<sup>2</sup>UE, Path2Integrity, Integrity, TRUST, and ENERI). This task will provide the groundwork for T6.2 and T6.3 and will ensure that synergies with related initiatives are created to foster convergence and facilitate cooperation in RE/RI education across Europe.

## 2 Background

In order to amplify recent EU-funded initiatives, we focused on mapping and analysing RI and RE training materials developed within the European context in recent years (2015-ongoing projects). We focused mainly on training materials for RI, as these materials were more relevant to the aims of BEYOND. Although different mapping exercises have been done by recent EC-funded initiatives (e.g., [VIRT<sup>2</sup>UE](#), [PREPARED](#)), BEYOND mapping aimed to understand the state of the art of training materials regarding their utilisation of insights from behavioural research and moral psychology in ethics education. For example, an extensive overview of online freely available RI educational resources was drafted within the VIRT<sup>2</sup>UE project ([VIRT<sup>2</sup>UE D2.1](#); Pizzolato, Abdi & Dierickx, 2020) focused mainly on understanding the state of the art in terms of content, teaching approaches, means of delivery (face-to-face or online), typology of the educational resources (e.g., videos, online training, books, etc), and so on. This overview has been uploaded to the online platform of the [Embassy of Good Science](#). Moreover, in order to develop a strategy for the development of new training materials and tools, results for the review study carried out by WP1 were taken into consideration. WP1 review focuses on the utilisation of insights from empirical and behavioural research in ethics education and psychology.

The VIRT<sup>2</sup>UE mapping exercise highlighted the importance of educational resources in this field and identifies the most common topics, such as research misconduct, publication ethics, data management, mentor-trainee responsibilities, conflicts of interest, peer review, research with humans and animals, and collaborative research. While these topics are considered fundamental for building RI educational curricula, newer topics like financial, societal, and environmental responsibilities are gaining attention. The need for specific RI resources for various scientific fields is emphasised, and resources targeting administrative staff involved in research support are also mentioned. The teaching approach in the reviewed materials were

predominantly passive, focused on conveying factual knowledge, with a small percentage adopting a proactive teaching style. The authors suggested that a proactive approach has proven to be more efficient in RI education. The principle-based approach, which emphasises compliance with rules and obligations, is commonly used, but the virtue-based approach, which focuses on developing researchers' moral character, is seen as equally valuable and should be incorporated into RI education.

PREPARED mapping focuses on research ethics and integrity during times of crisis. The project analysed previously and currently funded projects with relevant training materials, tools, and hosting facilities. The synergy map created through this analysis identified potential collaborations with related projects and supported the adoption of PREPARED outputs. The map highlighted effective practices, such as using modular and visually appealing materials, encouraging active involvement and reflection through storytelling, role playing, and multimedia, engaging learners with certificates and quizzes, localising materials to account for regional differences, and incorporating real-life case studies. The map also identified potential repositories and collaboration opportunities for PREPARED materials. In order to identify relevant training resources, we asked for contributions from our RI and RE network. Some of the BEYOND consortium members as well as EUREC were previously involved in mapping training materials for other EU-funded projects.

The review carried out by WP1 (T1.1) focused on aspects of RI and RE empirical research relating behavioural and organisational ethics and moral psychology. T1.1 conducted a scoping literature review on research covering the individual and organisation psychological, sociological and educational factors over the past ten years (2013-2023) on the promotion of research ethics and integrity (REI), and breaches of these standards including research misconduct (RM) and questionable research practices (QRPs). The completion of the literature review is part of the Milestone 1.1 (due in month 6). The paragraphs below report a summary of the above-mentioned review.

This research found that an emerging pattern in the literature emphasises the influence of the environmental context of a research-performing organisation (RPOs) on researchers' behaviour. This includes career pressures on researchers such as the pressure to publish or win research grants; financial and institutional conflicts of interest between institutions, research funders, individual researchers and sometimes human research participants; and institutional and regional cultural specificities. With the latter factor, translating ethical standards into culturally appropriate norms and values can be challenging. This suggests that ethical solutions require flexibility and creativity in relation to context, stakeholders and value orientations rather than simply applying prescriptive ethical, legal or methodological regulations universally across contexts.

A prevalent theoretical framing on the relationship between moral psychology to REI, and violations thereof, is the theory of planned behaviour (TPB) which states that intention motivates behaviour, and that moral attitudes and subjective norms influence behaviour

through individuals' intentions. In addition to the current methodology, alternative research approaches place emphasis on categorizing and structuring the connection between specific personality traits and one's ethical inclinations. These methodologies not only delve into the correlations between distinct personality dimensions and ethical orientations but also actively consider the role of moral self-regulation within this intricate framework. By focusing on the taxonomization of these multifaceted relationships, these approaches seek to provide a comprehensive understanding of how individual personality traits influence ethical decision-making processes and moral behaviours, shedding light on the intricate interplay between personal dispositions and ethical considerations. However, this approach was contested by research that suggested the tendency to commit academic dishonesty is more influenced by situational factors, rather than fundamental personality traits. Some research has also shown that individuals' emotional states influenced their likelihood to commit RM, and that stress and negative emotions could be contributing factors. However, other research on emotion and stress either contradict this relationship or is inconclusive. Research also indicates that past conduct is likely to influence current ethical behaviour in the context of RM, and as such there needs to be earlier educational intervention at the undergraduate level to prevent or disrupt patterns of unethical behaviour and poor practices in research.

## 2.1 Mapping

Besides analysing the training materials in term of their utilisation of insights into behavioural research and moral psychology, we also analysed the training materials by using reduced versions and the characterisation grid developed during the VIRT2UE project (Pizzolato, Abdi & and Dierickx, 2020). We characterised the training materials based on learning goals, teaching style (proactive vs passive), teaching approach (group vs standalone), career-level customisation, discipline customisation, topic(s), availability of training guides, and date of most recent updates.

We mapped and analysed training materials developed by the following EU-funded projects (in chronological order):

- PRINTEGER. EU-funded project, 36 months (01/09/2015–01/09/2018), name of the training UPRIGHT (Supplement 5.1).
- TRUST. EU-funded project, 39 months (01/10/2015–31/12/2018) (Supplement 5.2).
- ENERI. EU-funded project, 38 months (01/09/2016–31/10/2019), ENERI classroom and decision tree (Supplement 5.3).
- RID-SSISS (Research identity development: strengthening science in society strategies). Erasmus+-funded multidisciplinary three-year project (2017–2020) (Supplement 5.4).
- EnTIRE. EU-funded project, 54 months (01/05/2017–31/10/2021) (Supplement 5.5).
- VIRT2UE. EU-funded project, 42 months (01/06/2018–30/11/2021), VIRT2UE train-the-trainer programme (Supplement 5.6).



- Path2Integrity. EU-funded project, 42 months (01/01/2019–3/06/2022) (Supplement 5.7).
- INTEGRITY. EU-funded project, 42 months (01/01/2019–31/06/2022) (Supplement 5.8).
- BRIDGE (Bridging Integrity in Higher Education, Business and Society). Erasmus+-funded project, multidisciplinary three-year project (2020–2023) (Supplement 5.9).
- ROSiE. EU-funded project, 36 months (01/04/2021–, ongoing) (Supplement 5.10)

The recent developments in training materials have shifted their focus towards promoting critical thinking skills, developing the moral character of researchers, and enhancing dialogical competences. Pedagogical approaches range from constructivism to virtue ethics, employing strategies such as empowerment, dialogical approaches, values-based approaches, and case-based approaches. Techniques like storytelling, role-play, constructive agreement, collaboration, reflection, and scaffolded self-study are utilised for teaching and learning. The evaluation of learning primarily occurs through reflective exercises, often incorporating face-to-face sessions and collaborative feedback.

The learning objectives vary based on career levels, with training materials primarily aiming to raise awareness about RE, RI, responsible research practices, and related issues. Specific topics covered include RI, RE, RE/RI, and open science. Training materials such as those from VIRT2UE focuses more on the development of the moral character of researchers by using the virtue-ethics teaching approach and by contextualising the discussions by taking into consideration real-life cases. Path2Integrity seeks to address the difficulties and lack of clarity in research and its outcomes by offering logical reasoning, defining common goals and standards, creating prerequisites for discussion, evaluating the advantages and disadvantages of various approaches, and encouraging active participation from learners. The INTEGRITY project aims to empower students by addressing academic and RI issues that vary across disciplines and educational levels. It focuses on developing customised teaching tools that cater to students' individual perceptions and needs. By promoting critical autonomy and reflection, the project seeks to help students navigate and understand integrity issues in their own field of study throughout their academic journey. While all training materials include passive self-study sections providing concrete knowledge, group discussions are also encouraged.

Some training materials are tailored to specific career levels, such as undergraduate students, postgraduates, researchers, research ethics committee members, and research integrity officers. Although many case studies, examples, and scenarios are related to the biomedical sciences, there is no explicit disciplinary customisation of materials,

The range of RI topics covered by the training materials includes the [9 ORI topics](#), research design, and conducting research. ENERI and TRUST training materials also address topics relevant to RE, such as equitable research, biobanks, and clinical trials.

Among the training materials, VIRT2UE has developed the only programme with a comprehensive trainer guide, while other projects, like INTEGRITY and Path2Integrity, provide

less detailed instructions for conducting training. ENERI and PRINTEGER offer a brief introductory section on using the materials, but the remaining training materials lack a dedicated trainer guide.

Not all the trainings mapped take into consideration external, organisational and behavioural factors that take a broad view of what can impact responsible research practices. Although some training developed exercises focusing on students, PhD researchers and early-career researchers, they do not deal with the influences that the research environment/climate can have on students, PhD researchers and junior academics in their professional settings. There is the need to equip students, PhD researchers and junior academics with critical-thinking related skills in order to be able to make conscious decisions in relation to RE/RI practices.

Although mentoring is addressed in different ways in the different trainings, the trainings do not seem to be enough to increase awareness about the role of mentors and their responsibilities. Moreover, there seems to be the need to develop training not for mentors, but specific to research supervisors. While mentors contribution is often on voluntary basis, research supervisors have an institutional role and their involvement in the competencies-development process of early-career researchers (ECRs) has to be regulated by institutional guidelines. Supervision can be divided in intellectual, behavioural, managerial and relational supervision, and supervisors need to develop skills in relation to all these spheres (Pizzolato and Dierickx, 2022). There is also the need to develop training on mentorship and supervision focusing on early-career researchers and junior post-docs (junior supervisors). In addition, since mentoring and supervision is a two-partner relationship, there might be the need to develop training on mentorship and supervision focusing on mentees and supervisees as well as supervisors and mentors.

In general, training focusing on structural and organisational issues (research environment), and how to deal with external factors and pressure is completely missing. Training focused on publication ethics and how to deal with publication pressure is also missing. The same can be said about training that takes into consideration academic pressure in general and “researchers’ fear of failing” that can lead to RM or QRPs.

Training focusing on social, financial and environmental issues is completely missing. Raising awareness of the social, financial and environmental consequences of RM and QRPs is missing. Moreover, training focusing on broader RI issues such as diversity and inclusion is missing.

Since new developments in relation to the use of AI within the research environment are emerging, training on raising awareness of AI in doing research would be helpful.

### **3 Strategy for the development of supplementary trainer guides and new training materials and tools**

#### **3.1 Strategy for the development of supplementary trainer guides**

##### **3.1.1 Existing training materials with trainer guides**

Some of the training materials assessed already contain a trainer guide to support trainers and teachers in the provision of training. Projects that already have a well-developed trainer guide are the following: VIRT2UE, Path2Integrity, Integrity, and ROSiE Other projects (ENERI and PRINTEGER) report only brief instructions on how to use their material.

##### **3.1.2 Strategy on trainer guides**

A trainer guide is a document or resource that provides instructional guidance and support to trainers facilitating a training session. It serves as a roadmap for trainers, offering them step-by-step instructions, tips, and information on how to effectively deliver training sessions and achieve the desired learning outcomes. The objective of this task is to create a trainer guide that condenses important findings from empirical and behavioural research on effective RE/RI education. The guide will complement the materials and tools examined in this deliverable. It will offer practical advice on teaching RE/RI to various target groups, including students, early career researchers, and experienced researchers. To ensure consistency and collaboration with the original materials, the developers will be invited to participate in a co-creation workshop. The trainer guides will be refined based on feedback and lessons learned from the pilot tests conducted later on.

The development of trainer guides to complement existing training materials is possible in different ways. Trainer guides can be adapted to the following:

- project aims
- career levels
- learning goals

Even though adapting to all three options might add value to trainer guides, to improve usability, it is important to develop a guide that allows trainers to engage successfully with a target audience that displays similar needs and expectations. The WP6 analysis (see section 2) demonstrates that training materials targeting different career levels have been successfully developed in previous years. Different modules focusing on a specific career level can be included in the same cluster. For each cluster, a specific trainer guide can be developed to facilitate and support trainers.

- The strategy for the development of trainer guides includes the following:
- Identification and grouping of modules targeting the same career level in different clusters.
- Identification of learning objectives that trainers should aim to achieve.
- Development of detailed instructions for trainers for each training module, including suggested activities, discussion points, and time allocations.
- Continuous training material development to ensure that the training guide is aligned with the training.
- First revision of the trainer guides.
- Pilot test.
- Second revision of the trainer guides.

To enhance usability, a trainer guide should contain the following:

- **Introduction:** An overview of the modules assembled from different training programs focusing on the same career level, their objectives, and any necessary background information.
- **Training Flow:** A clear outline of the training modules or topics, highlighting the sequence and logical progression of the content.
- **Training Methods:** Guidance on various instructional methods and techniques that can be employed during the training, such as lectures, group discussions, case studies, or hands-on exercises.
- **Facilitation Tips:** Practical advice and best practices for trainers, including tips on engaging participants, managing group dynamics, handling questions, and adapting the training to different learning styles.

### **3.2 Strategy for the development of new training materials and tools**

To develop effective training materials, it is crucial to consider recent developments in the field of RI and RE. These developments have emphasised the importance of promoting critical thinking skills, fostering the moral character of researchers, and enhancing dialogical competences. This shift in focus provides a solid foundation for crafting new training materials that address these key aspects.

To enhance the learning experience, various techniques can be incorporated. Storytelling, role-play, constructive agreement, collaboration, reflection, and scaffolded self-study are effective tools that facilitate active learning and participant engagement. These techniques encourage participants to apply their knowledge to practical scenarios. Moreover, the gamification approach based on a value-reflection game methodology will be used to increase participant engagement and facilitate learning.

Tailoring the training material to specific career levels is crucial for ensuring its relevance and effectiveness. By addressing the unique needs and knowledge levels of different groups, such as the students, postgraduates, researchers, research ethics committee members, and research integrity officers, the training materials can effectively cater to their specific requirements. While disciplinary customisation may not be the primary focus, it is important to include case studies, examples, and scenarios that resonate with different fields. This approach ensures that the training material is relatable and applicable to participants from diverse disciplines, enhancing its practicality and real-world relevance.

The evaluation of learning outcomes is essential to measure the effectiveness of the training materials. Reflective exercises should be integrated throughout the materials to allow participants to assess their understanding, apply concepts, and critically reflect on their learning journey. This can be done in collaboration with WP4, which focuses on the development of tools for the measurement of the efficacy of the training, and during the pilot-testing of the new tools. Additionally, incorporating face-to-face sessions and collaborative feedback enables a comprehensive evaluation process that fosters continuous improvement. For this reason, it is important to pilot new training materials to understand what can be strengthened.

Training materials on responsible mentoring, supervision and leadership for senior researchers and senior research managers needs to be developed. Not just focusing on senior researchers, but also focusing on supervisees and junior supervisors (early-career research and junior post-docs). Training material on structural challenges and on external factors that can have an impact and lead to RM and QRPs are needed. Moreover, training focusing on publication ethics and on publication pressure, is especially needed for junior researchers, and can be further developed within BEYOND. In addition, training materials should cover emerging issues, such as diversity, inclusion, research environments, and environmental issues.

WP6 will design animations that can be integrated into external training and/or into the trainer guides. For the development of the animations, BEYOND plans to work with the [PREPARED](#) and [iRECs](#) projects, in order to join forces and strengthen collaboration with other relevant EC-funded projects. This provides a chance to reduce time and costs involved in creating training materials, ensuring greater utilisation of our outputs by a larger audience, as they will be endorsed and supported by three projects. It also allows for a wider range of perspectives and enables us to focus on the specific areas of training where we excel, thanks to specialisation and division of labour. To accomplish this, we need to identify the training topics with utmost precision to explore potential opportunities where we can create a single animation that benefits all three projects. The award-winning [PREPARED](#) illustrator – animator - designer is also available for a short period of time for BEYOND. The focus will be on value-for-money animations, which the designer has previously developed for research ethics training, in particular 2D animations and 3D animations using iStock clips. For an example, see the following animation. [G21 Animation](#)



*(Screenshot from G21Animation)*

To enhance and expand the value-reflection game methodology, a gamification approach will be implemented. This approach aims to further develop and diversify existing methodologies in order to increase awareness and understanding of RE/RI, particularly targeting students and early-career researchers. Gamification involves incorporating elements of game design and mechanics into non-game contexts, such as educational activities, to engage participants and enhance their learning experience. By applying this approach to the value-reflection game methodology, the goal is to make the learning process more interactive, enjoyable, and immersive and also account for the fact that ethical decisions are not merely exercises in correct thinking but involve emotional, contextual, organisational components.

The value-reflection game methodology involves a structured activity that prompts participants to reflect on ethical values, decision-making processes, and the implications of their research. By using a gamification approach, elements such as challenges, rewards, levels, and competition can be integrated to motivate and engage participants in a more dynamic and interactive manner. The case-based methodology guides students through choices that are not perfect and that require prioritisation of certain values before others, followed by a discussion. The method requires taking both individual responsibility for decisions as well as consensus-building joint discussion. It combines the individual micro-level beliefs with more abstract ethical principles and values and aims to produce acceptable practical solutions for ethical dilemmas and challenges. The primary aim of this gamified approach is to foster a deeper understanding and appreciation of RE/RI concepts among students and early-career researchers. By making the learning process more engaging and enjoyable, the hope is that

participants will be more likely to actively participate, internalise the principles of responsible research, and apply them in their own work (Siemon & Eckardt, 2017). Overall, this gamification approach seeks to refine and broaden the existing value-reflection game methodology by leveraging the power of games to educate and raise awareness about RE/RI, targeting specifically the younger audience of students and early-career researchers.

The collection of feedback from trainers and participants enables the identification of areas for enhancement and ensures that the materials keep pace with emerging research and best practices in RI and RE. Continuous iteration and improvement of the training materials will contribute to their long-term effectiveness and impact.

To maximise the reach and impact of the training materials, it is important to develop a robust dissemination plan. Collaborating with relevant organisations, institutions, and networks can facilitate widespread accessibility and promotion. Leveraging online platforms, conferences, workshops, and other avenues for showcasing the benefits and effectiveness of the materials can help generate interest and encourage their adoption.

#### **4 What's next**

Based on the information provided by this analysis, WP6 will develop a trainer guide to supplement the materials and tools reviewed. The trainer guide will provide practical guidance on how to effectively teach RE/RI to different target groups, such as students, early career researchers, and experienced researchers, using a variety of methodologies. WP6 will develop two sets of materials and tools: 1) training materials on responsible mentoring, supervision, and leadership for senior researchers and senior research managers and 2) training materials incorporating a gamification approach to refine and broaden a value-reflection game methodology that raises awareness for RE/RI, especially among students, early-career researchers. Finally, WP6 will pilot test the materials and tools developed in T6.2 and T6.3.

## 5. Supplements

### 5.1 PRINTEGER



**Description:** The UPRIGHT training programme developed by the PRINTEGER project uses a case-based approach based on constructivism (like the ENERI classroom). The training programme is based on self-study and suggested proactive group discussions of the dilemmas and cases provided. The training materials provide general information on the topic of RI and on selected topics (RI and RE). There is no specific customization (neither career-level nor discipline); however, the training programme has been developed with the aim of raising awareness among “newcomers” to RI and RE. Like the ENERI classroom, the training programme has a clear thematic structure with well-defined modules. Key RI topics are addressed. On the contrary, RE is addressed only marginally. Besides providing knowledge and information on the topic, the training programme contributes to the development of the moral character of researchers by encouraging reflection on specific dilemmas and cases.

Module	Learning goals	Teaching approach (proactive-passive)	Teaching approach (group-standalone)	Career-level customization	Disciplinary customization	Topic(s)	Training guide	Optional	Last update
Introduction to RI –On being a scientist (9 episodes – video)	Raising awareness about research integrity and responsibility	Passive	Self-study	All career levels with no RI competencies	No	Scientific misconduct/supervision/COI/research design	Brief introductory section	Online training material	N/A



	e practices								
Contemporary topics	Promote competencies of RI and promote reflection	Proactive and passive	Self-study-group discussion of the dilemmas provided	All career levels with no RI competencies	No	Peer-review, authorship, text recycling, open access, systematic review	Brief introductory section	Online training material	N/A
Official and institutional aspect	Promote competencies of RI norm and policies and promote reflection	Proactive and passive	Self-study-group discussion of the cases provided	All career levels with no RI competencies	No	RI and law, code of conduct and policies, assessment of researchers, confidential advisor, role of research leaders	Brief introductory section	Online training material	N/A
FFP	Promote competencies of FFP and promote reflection	Proactive and passive	Self-study – group discussion of the cases provided	All career levels with no RI competencies	No	FFP	Brief introductory section	Online training material	N/A
Research ethics	Promote competencies of research ethics in relation to precise topics and promote reflection	Proactive and passive	Self-study – discussion of the cases provided	All career levels with no RI competencies	No	Animal studies, COI, and data management	Brief introductory section	Online training material	N/A

Questionable research practices	Promote competencies of QRPs in relation to precise topics and promote reflection	Proactive and passive	Self-study – group discussion of the cases provided	All career levels with no RI competencies	No	Exaggeration, predatory publishing, and bias	Brief introductory section	Online training material	N/A
Dilemmas (from the Dilemma game)	Promote self-reflection and discussion	Proactive	Discussion of the cases provided	All career levels with no RI competencies	No	N/A	Brief introductory section	Online training material	N/A

All materials can be found here: <https://printeger.eu/upright/toc/>

## 5.2 TRUST

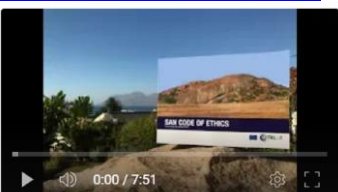




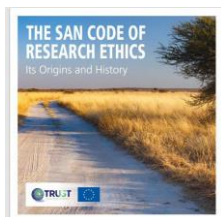
**Description:** TRUST did not develop detailed training materials; it was not requested in the call. After the completion of the project, two comprehensive research ethics courses were developed which used the moral framework developed by TRUST around fairness, respect, care, and honesty. These modules cannot be used because they are either behind a paywall (Epigeum, two courses, 8 modules) or they were developed for one institution only (one course, 6 modules). They were not developed with TRUST resources but used publicly available TRUST outputs. The materials produced by TRUST, all of which are open-access video clips or case studies, could be used to build a short course on ethics dumping, helicopter research, and inequitable research partnerships. All of these are irresponsible research practices which can often be prevented – or at least reduced – by appropriate training and understanding.

Module	Learning goals	Teaching approach (proactive-passive)	Teaching approach (group-standalone)	Career-level customization	Disciplinary customization	Topic(s)	Training guide	Optional	Last update
Overall	Improve awareness, knowledge, and skills (critical thinking)	Proactive (interactive) and passive	Standalone (videos), group discussion of the cases provided	Undergraduates and graduates	No	Behavior towards responsible research practices, common everyday ethical dilemmas Rules, virtues, and values, ethical codes	no	Online videos	N/A

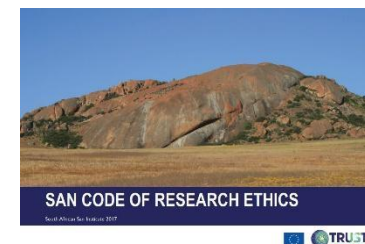
All videos are suitable for research ethics training and are divided into three categories.

1. San Code of Research Ethics
2. TRUST Code – A Global Code of Conduct for Equitable Research Partnerships (formerly known as “Global Code of Conduct for Research in Resource-Poor Settings”)
3. Voices of vulnerable populations who may have been exploited in research.

<b>San Code of Research Ethics</b>	<b>Learning goals</b>	<b>Teaching approach</b>	<b>Career-level customization</b>	<b>Disciplinary customization</b>	<b>Topic</b>
<a href="https://youtu.be/Px-0l_-wjjY">https://youtu.be/Px-0l_-wjjY</a> 	Justify and explain the San Code of Research Ethics.	Video-assisted learning (VAL) for self-directed engagement. In part, didactic, but also aims to promote reflection and challenge underpinning assumptions.	All levels	All disciplines	Establishing non-exploitative partnerships with the San indigenous group in research. Also suitable to obtain insights into working with other indigenous groups.
<a href="https://youtu.be/b4FgXnLKs_0">https://youtu.be/b4FgXnLKs_0</a> 	Describe and illustrate the values-based expectations of the San vis-à-vis researchers.		All levels	All disciplines	Illustrating the importance of the values of fairness, respect, care, honesty, and process in research collaborations with the San.
<a href="https://youtu.be/HOdw3mv7JSo">https://youtu.be/HOdw3mv7JSo</a> 	Justify and explain the history of the development of the San Code of Research Ethics.		All levels	All disciplines	Illustrating the exploitation of the San population by researchers and action taken in the development of the San Code of Research Ethics.





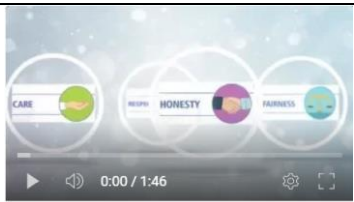
**Additional Materials:**



The San Code of Research Ethics: <https://www.globalcodeofconduct.org/affiliated-codes/>

The San Code of Research Ethics – its origins and history: <https://www.globalcodeofconduct.org/affiliated-codes/>

The TRUST Code	Learning goals	Teaching approach	Career-level customization	Discipline customization	Topic
<a href="https://youtu.be/POBoERqO1xY">https://youtu.be/POBoERqO1xY</a> 	Justify and explain the TRUST ethics code and its development	Video-assisted learning (VAL) for self-directed engagement. In part, didactic, but also aims to promote reflection and challenge underpinning assumptions.	All levels	All disciplines	Establishing equitable research partnerships and avoiding ethics dumping and helicopter research in international collaborative research.
<a href="https://youtu.be/Z82PE51i5vg">https://youtu.be/Z82PE51i5vg</a> 	Discuss the 23 articles of the TRUST code		All levels	All disciplines	Establishing equitable research partnerships and avoiding ethics dumping and helicopter research in international collaborative research.
<a href="https://youtu.be/wzPQSGk6pw4">https://youtu.be/wzPQSGk6pw4</a>	Discuss the four values on which		All levels	All disciplines	Values-based approach to research ethics.



	<p>the TRUST code is based</p>				
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**Additional Materials:**

The TRUST Code: <https://www.globalcodeofconduct.org/>

Ethics dumping case studies: <https://link.springer.com/book/10.1007/978-3-319-64731-9>

The TRUST Code, the book: <https://link.springer.com/book/10.1007/978-3-030-15745-6>

<p><b>Voices of vulnerable populations</b></p>	<p><b>Learning goals</b></p>	<p><b>Teaching approach</b></p>	<p><b>Career-level customization</b></p>	<p><b>Discipline customization</b></p>	<p><b>Topic</b></p>
<p><a href="https://youtu.be/btWu_OJCq88">https://youtu.be/btWu_OJCq88</a></p> 	<p>Insightful explanation of the exploitation of vulnerable populations</p>	<p>Video assisted learning (VAL) for self-directed engagement. In part, didactic, but also aims to promote reflection and challenge underpinning assumptions.</p>	<p>All levels</p>	<p>All disciplines</p>	<p>Working with vulnerable populations</p>
<p><a href="https://youtu.be/A4_Mvdwl_Gc">https://youtu.be/A4_Mvdwl_Gc</a></p> 	<p>Insightful explanation of the value of respect when working with Indigenous peoples</p>	<p>Video assisted learning (VAL) for self-directed engagement. In part, didactic, but also aims to promote reflection and challenge underpinning assumptions.</p>	<p>All levels</p>	<p>All disciplines</p>	<p>Working with vulnerable populations</p>

<a href="https://youtu.be/jMhCUNw9eAo">https://youtu.be/jMhCUNw9eAo</a> 	<p>Insightful explanation of the value of fairness when working with Indigenous peoples</p>		<p>All levels</p>	<p>All disciplines</p>	<p>Working with vulnerable populations</p>
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### 5.3 ENERI



**Description:** In order to promote good research practices, ENERI facilitated sharing experiences through communication and exchange; training and capacity building; and establishing an e-Community for experts in research ethics and research integrity. ENERI uses a case-based teaching approach based on constructivism. The ENERI classroom provides training materials for several target groups which mainly lack training resources tailored to their needs. The main target groups of the training material and curricula tool are both new and experienced members of 1) research integrity advisory boards, committees handling allegations or working with research integrity policy development, research integrity officers and advisors, and research integrity ombudspersons (RIOs); 2) research ethics committees, including their members and their secretariats (RECs); and 3) experts and officers in EU bodies. The materials can be used with the help of a facilitator to maximize interaction and feedback, but they can also be used independently for competence development. ENERI was a project targeted for experts on research ethics and integrity, providing materials, training, and networking with a view to bridging research ethics and research integrity. Themes that experts deal with that are associated with research integrity include good scientific practice, questionable research practices, research misconduct, responsible authorship, peer review, and whistleblowing. Themes that experts on research ethics deal with include, for instance, ethics review, the protection of human rights, the safety of clinical trials, informed consent procedures, research with participants unable to consent, and the protection of animals. These have traditionally been regarded as separate domains, but in recent years, themes common to both RE and RI have attracted the attention of experts in each domain. Comprehensive and overlapping issues involving both integrity and ethics related considerations involve, for example, data management and data protection, open data sharing, open access, transparency, fairness, reliability and credibility, and conflicts of interest. Developing and sharing good practices around these topics benefit experts in both domains.



Module	Learning goals	Teaching approach (proactive-passive)	Teaching approach (group-standalone)	Career-level customization	Disciplinary customization	Topic(s)	Training guide	Optional	Last update
Home	N/A	N/A	N/A	N/A	N/A	Introductory section	N/A	N/A	N/A
Research Integrity <a href="https://eneri.mobali.com/research-integrity">https://eneri.mobali.com/research-integrity</a>	Promote knowledge, awareness, self-reflection on RI	Proactive	Self-study with scaffolded cases or group discussion	RI and RE experts	No	Research integrity boards and codes of conducts, research integrity principles, violations of research integrity, plagiarism, authorship, peer review, dealing with violations and allegations of misconduct, whistleblowing and whistleblower protection, mentoring for stronger cultures of integrity.	No	Online training material	N/A
Research Ethics <a href="https://eneri.mobali.com/research-ethics">https://eneri.mobali.com/research-ethics</a>	Promote knowledge, awareness, self-reflection on RE	Proactive	Self-study with scaffolded cases or group discussion	RI and RE experts	No	Research ethics committees: main tasks and challenges, core principles of research ethics, research involving vulnerable groups, research in emergency situations, biobanks, specific aspects of clinical drug trials, ethics review in non-medical fields.	No	Online training material	Jan 17, 2023
Overlapping issues <a href="https://eneri.mobali.com/overlapping-issues">https://eneri.mobali.com/overlapping-issues</a>	Promote knowledge, awareness, self-reflection on RE	Proactive	Self-study with scaffolded cases or group discussion	RI and RE experts	No	Conflicts of interest, data protection, social responsibility, open science, mentoring for stronger cultures of integrity.	No	Online training material	N/A



Developing infrastructures <a href="https://eneri.mobi.com/node/63">https://eneri.mobi.com/node/63</a>	Supporting countries with developing infrastructures in ethics by also improving best practices	Passive	Self-study	Experts and officers in EU bodies	No	It provides suggestions on how countries, regions, or institutions that wish to develop their integrity and ethics infrastructures can approach the topic in question. For instance, what is required for setting up ethics review in non-medical fields or how to create a system for ethics support for ombud persons.	No	Online training material	N/A
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### ENERI Classroom

Module	Learning goals	Teaching approach (proactive-passive)	Teaching approach (group-standalone)	Career-level customization	Disciplinary customization	Topic(s)	Training guide	Optional	Last update
ENERI decision tree <a href="https://eneri.eu/decision-tree/">https://eneri.eu/decision-tree/</a>	Raising awareness about which ethical questions and challenges might arise during a planned research project.	Proactive	Self-study and self-reflection	Researcher, RECs, and RIOs	No	N/A	Brief description on how to use the tree	Online training material	

## 5.4 RID-SSISS



Researcher Identity Development:  
Strengthening Science in Society Strategies

**Description:** The RID-SSISS training aims to help beginner and more experienced researchers develop their research ethics competencies in HE institutions. A CSCL (Computer-Supported Collaborative Learning) ethics resource was designed that utilised cases, collaboration, and structural scaffolding (see Table 1 for an overview). This resource provides learners with opportunities to gradually develop research ethics competencies, guiding them through three levels. The *Foundation level* focuses on developing (but also helping learners to recall) central concepts of REI, suitable for bachelor's, master's, and doctoral students but also academic staff and researchers. The *Advanced level* is focused on helping learners to identify ethical principles and utilising the ethical analysis. This level is suitable for those researchers who have covered the Foundation level but also for more experienced PhD students and academics and researchers with some prior REI training. The *Leadership level* develops REI leadership competencies as well as enhances ethical analysis skills. This level is intended for experienced PhD students, postdocs, supervisors, and others who demonstrate prior REI training. These three levels form a training resource which helps to conceptualize REI as part of a HE system, encouraging actors to recognise one's role in the system and become more competent to support ethical practices and behaviour (see Table 1). During the *Foundation level* training, participants learn to guide their own REI practices and behaviour. During the *Advanced level*, they learn to guide and help others. Finally, at the *Leadership level*, they practice leading the institutional REI practices.

This ethics resource follows the systems approach (Bertram Gallant, 2011) according to which building the ethical institution is to see the integration of all the levels present – individual, research group, department, organisation, and broader research community (see table 2). The resource relies on pedagogical approaches that have proven to be effective in developing ethics competencies – namely cases and collaborative group work. In addition, a scaffolding framework allows for the inclusion of suitable forms of support to learners of different expertise levels in decision-making, process management, and articulation and reflection. (Tammeleht, 2022). The development of the resource is heavily research-based and has been reported in the following publications:

Tammeleht, A. (2022). Facilitating the development of research ethics and integrity competencies through scaffolding and collaborative case-based problem-solving. *Helsinki Studies in Education* no 146.

Löfström, E. & Tammeleht, A. (2023). A pedagogy for teaching research ethics and integrity in the social sciences: Case-based and collaborative learning. In G. Curtis (Ed.) *Academic Integrity in the Social Sciences. Perspectives on Pedagogy and Practice*. Springer.

Tammeleht, A., Löfström, E. & Rodríguez-Triana, M. J. (2022). Facilitating development of research ethics and integrity leadership competencies. *International Journal of Educational Integrity*, 18, 11, 1-23. <https://doi.org/10.1007/s40979-022-00102-3>

Tammeleht, A., Koort, K., Rodríguez-Triana, M. J. & Löfström, E. (2022). Knowledge building process during collaborative research ethics training for researchers: experiences from one university. *International Journal of Ethics Education*, 7, 147–170. <https://doi.org/10.1007/s40889-021-00138-y>

Tammeleht, A., Rodríguez-Triana, M. J., Koort, K. & Löfström, E. (2021). Scaffolding collaborative case-based learning during research ethics training, *Journal of Academic Ethics*, 19, 229–252. <https://doi.org/10.1007/s10805-020-09378-x>

Tammeleht, A., Rodríguez-Triana, M. J., Koort, K. & Löfström, E. (2019). Collaborative case-based learning process in research ethics. *International Journal for Educational Integrity*, 15(6), 1-22. <https://edintegrity.biomedcentral.com/track/pdf/10.1007/s40979-019-0043-3>

Module	Learning goals	Teaching approach (proactive-passive)	Teaching approach (group-standalone)	Career-level customization	Disciplinary customization	Topic(s)	Training guide	Optional	Last update
Foundation level <a href="https://en.researchethicscompass.net/">https://en.researchethicscompass.net/</a>	Raise awareness of ethical issues during the research process; practice utilising the codes of conduct, being familiar with central topics; learn together as a team, collaborate with peers.	Proactive	Self-study and self-reflection, group discussion	Bachelor's, master's, doctoral students, but also academic staff/researchers	No	Ethical aspects of the research process	No	Online training material	N/A

<p>Advanced level  <a href="https://www.researchethicstraining.net/">https://www.researchethicstraining.net/</a></p>	<p>Develop one's research ethics competencies by combining previous knowledge and implementing new tools; identify ethical issues by determining which ethical principle (Kitchener, 1985) might be at stake; utilise the ethical analysis (Mustajoki &amp; Mustajoki, 2017) steps to provide solutions to ethical dilemmas.</p>	<p>Proactive</p>	<p>Self-study and self-reflection, group discussion</p>	<p>Experienced PhD students and academics/researchers with some prior REI training</p>	<p>No</p>	<p>Ethical principles, Virtues and cases</p>	<p>No</p>	<p>Online training material</p>	<p>N/A</p>
<p>Leadership level  <a href="https://www.researchethicstraining.net/leadershiplevel">https://www.researchethicstraining.net/leadershiplevel</a></p>	<p>Develop research ethics competencies by combining previous knowledge and implementing new tools; identify which ethical principles might be at stake in a case. Utilise the ethical analysis steps to provide solutions to ethical dilemmas; implement different ethical approaches to the possible courses of action; take the role of a REI leader and display (some) REI leadership competencies during their group work.</p>	<p>Proactive</p>	<p>Self-study and self-reflection, group discussion</p>	<p>Experienced PhD students, postdocs, supervisors</p>	<p>No</p>	<p>Variety of approaches people can apply to ethical analysis: consequentialist, rule-based or virtue-based.</p>	<p>No</p>	<p>Online training material</p>	<p>N/A</p>

## 5.5 EnTIRE



**Description:** The Entire project developed a series of 8 scenarios presenting a hypothetical narrative in relation to 8 different topics. These [scenarios](#) are part of the material on the Embassy of Science platform. Fiction gives educators the ability to illustrate what matters most – without having to worry about getting all the facts straight. Simple scenarios can help you identify what makes good researchers stand out or where common pitfalls lie. The scenarios are designed to help researchers, research ethics committees (RECs), research integrity offices (RIOs), and research administrators to become better acquainted with The European Code of Conduct for Research Integrity (ECCRI or ECoC) as a regulatory document that articulates the standards of good research practice. They also allow users to reflect on and apply their own national and institutional research ethics and research integrity codes as well as other key regulatory documents and guidelines. The goal is for the user to gain knowledge of the standards associated with good research practices and to make sense of these standards in different research contexts. The aim of all eight scenarios is to allow researchers, RECs, RIOs, and research administrators to focus their reflection on core principles and research contexts that enshrine good research practice as well as their local rules and practices.

Module	Learning goals	Teaching approach (proactive-passive)	Teaching approach (group-standalone)	Career-level customization	Disciplinary customization	Topic(s)	Training guide	Optional	Last update
Research Procedures and Research Integrity <a href="https://embassy.science/wiki/wiki/index.php/Resource:F6100097-fddb-4c77-9098-1bc767c34a6a">https://embassy.science/wiki/wiki/index.php/Resource:F6100097-fddb-4c77-9098-1bc767c34a6a</a>	Stimulate strategic thinking about issues in research ethics and research integrity.	Proactive	Self-study and self-reflection. group discussion	Researchers, RECs, RIOs, and research administrators	No	Hypothesizing after the results ('HARKing'); P-hacking; selection bias; university procedures, processes and guidelines to address HARKing, P-hacking and selection bias.	No	Online training material	02/10/2020
Collaborative Working Between Academia and Industry <a href="https://embassy.science/wiki/wiki/index.php/Resource:1d26fd13-1ced-44bc-">https://embassy.science/wiki/wiki/index.php/Resource:1d26fd13-1ced-44bc-</a>	Stimulate strategic thinking about issues in research ethics and research integrity.	Proactive	Self-study and self-reflection. group discussion	Researchers, RECs, RIOs, and research administrators	No	Conflicts of interest between academia and industry; data usage and data privacy; HARKing (Hypothesizing after the results are known); preregistration of studies; authorship criteria for academic publications; the duties of corresponding authors; non-publication of results; divergences in research integrity standards and	No	Online training material	02/10/2020

<a href="#">8d19-e094b37f8f70</a>						processes between international collaborators.			
Data Practices, Data Management and FAIR Principles <a href="https://embassy.science/wiki/wiki/index.php/Resource:45a04c31-5a75-4816-8484-2dd9b71d1674">https://embassy.science/wiki/wiki/index.php/Resource:45a04c31-5a75-4816-8484-2dd9b71d1674</a>	Stimulate strategic thinking about issues in research ethics and research integrity.	Proactive	Self-study and self-reflection. group discussion	Researchers, RECs, RIOs, and research administrators	No	Data protection and consent; FAIR principles for data management and stewardship; data copyright and data citation; data for personal research use.	No	Online training material	02/10/2020
Publication, Dissemination and Research Integrity <a href="https://embassy.science/wiki/wiki/index.php/Resource:Aef6b98d-9cc5-4db0-bffd-4a3daa99a3f3">https://embassy.science/wiki/wiki/index.php/Resource:Aef6b98d-9cc5-4db0-bffd-4a3daa99a3f3</a>	Stimulate strategic thinking about issues in research ethics and research integrity.	Proactive	Self-study and self-reflection, group discussion	Researchers, RECs, RIOs, and research administrators	No	Dual submissions; authorship lists; plagiarism; complaint procedures; editorial decisions; retraction.	No	Online training material	02/10/2020
Research Environments and Research Integrity <a href="https://embassy.science/wiki/wiki/index.php/Resource:C99f17ec-3d1e-4f7a-">https://embassy.science/wiki/wiki/index.php/Resource:C99f17ec-3d1e-4f7a-</a>	Stimulate strategic thinking about issues in research ethics and research integrity.	Proactive	Self-study and self-reflection, group discussion	Researchers, RECs, RIOs, and research administrators	No	Communication of the standards governing research integrity by universities and research organisations; environmental pressures to commit research misconduct; whistleblowing and the monitoring of research misconduct; barriers to reporting cases of research misconduct; power	No	Online training material	02/10/2020





<a href="#">bfc7-3e3607934ead</a>						imbalances between students/early-career researchers and senior academics.			
<p>Reviewing, Evaluating, Editing and Research Integrity</p> <p><a href="https://embassy.science/wiki/wiki/index.php/Resource:7f7810d8-74a2-42ac-906c-7f6a73fcd183">https://embassy.science/wiki/wiki/index.php/Resource:7f7810d8-74a2-42ac-906c-7f6a73fcd183</a></p>	Stimulate strategic thinking about issues in research ethics and research integrity.	Proactive	Self-study and self-reflection, group discussion	Researchers, RECs, RIOs, and research administrators	No	The integrity of peer review processes; institutional obligations to upholding the standards of good peer review practices; plagiarism.	No	Online training material	02/10/2020
<p>Safeguards, Data-sharing and the Disclosure of Sensitive Results</p> <p><a href="https://embassy.science/wiki/wiki/index.php/Resource:E99e20d0-8116-4d77-84ec-7df396703bf4">https://embassy.science/wiki/wiki/index.php/Resource:E99e20d0-8116-4d77-84ec-7df396703bf4</a></p>	Stimulate strategic thinking about issues in research ethics and research integrity.	Proactive	Self-study and self-reflection, group discussion	Researchers, RECs, RIOs, and research administrators	No	The ethical and regulatory standards governing data-sharing practices; the ethical dimensions of research involving children; amendments to research ethics protocols; research participant complaints against researchers; disclosure of sensitive research results.	No	Online training material	02/10/2020



<p>Training, Supervision and Mentoring with Integrity  <a href="https://embassy.science/wiki/wiki/index.php/Resource:67caae86-68db-49ea-8305-2010fe701aa6">https://embassy.science/wiki/wiki/index.php/Resource:67caae86-68db-49ea-8305-2010fe701aa6</a></p>	<p>Stimulate strategic thinking about issues in research ethics and research integrity.</p>	<p>Proactive</p>	<p>Self-study and self-reflection, group discussion</p>	<p>Researchers, RECs, RIOs, and research administrators</p>	<p>No</p>	<p>The obligations of research ethics committee members when it comes to their knowledge of different disciplinary designs, methodologies and analytical tools; the obligations to promote and provide training in different research integrity guidelines and standards; the relationships between discipline-specific, institutional and national codes of conduct; the navigation of the differences between discipline-specific, institutional and national codes of conduct; allegations of conflicts of interest; the duties and obligations of project coordinators and principal investigators.</p>	<p>No</p>	<p>Online training material</p>	<p>02/10/2020</p>
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## 5.6 VIRT<sup>2</sup>UE



**Description:** The H2020 VIRT<sup>2</sup>UE project ([link](#)) designed a training programme with a virtue ethics approach to Ethics and Research Integrity (ERI). The trainees, early career as well as experienced/senior researchers, are encouraged to reflect on and, subsequently, develop their moral character, which predisposes researchers to do good research. In particular, the VIRT<sup>2</sup>UE training supports participants in creating closer connections between ERI guidelines and codes, in particular the European Code of Conduct for Research integrity (ECoC); acquire theoretical knowledge about ERI and virtues; and be exposed to moral challenges related to real cases from the profession of a researcher. The VIRT<sup>2</sup>UE training programme is a blended learning program that consists of four components: it initiates with an online course (consisting of three modules), proceeds with a face-to-face participatory session (consisting of five modules/exercises), continues with subsequent assignments and practising (within the so-called interim period), and concludes with a second face-to-face participatory session. The assignments and interim practice target the development of the trainees' training skills by applying and, if necessary, adapting modules/exercises to their own context, e.g., language. The rhythm of the training of the face-to-face participatory sessions reflects the learning by doing approach. Trainees experience the modules/exercises as participants in the first face-to-face participatory session, and they are invited to practise their role as facilitators. Afterwards, during the assignment and practice interim period, the trainees are given the opportunity to join their own fellow trainees. At the second face-to-face participatory session, the trained trainers reflect on their experiences with facilitating the modules/exercises.

Module	Learning goals	Teaching approach (proactive-passive)	Teaching approach (group-standalone)	Career-level customization	Disciplinary customization	Topic(s)	Training guide	Optional	Last update
Introduction to Research Integrity	Raising awareness and increasing knowledge about research integrity and responsible practices	Passive and active	Self-study and self reflection	Researchers and RI experts	No	Four different sub-modules provide an introduction to the main principles of research integrity	Training manuals for trainers	Online training material	Jun 14, 2021
Introduction of Virtue Ethics to Research Integrity	Promote knowledge on virtue ethics	Proactive and passive	Self-study and self reflection	Researchers and RI experts	No	Four different sub-modules provide an introduction to the main principles of virtue ethics	Training manuals for trainers	Online training material	Jan 17, 2023
Virtue Ethics under Current Research Conditions	Promote reflection on the current research culture and conditions that undermine values inherent in the scientific endeavour	Proactive and passive	Self-study and self reflection	Researchers and RI experts	No	Four different sub-modules provide an introduction to research culture and considerations that can lead to research misconduct	Training manuals for trainers	Online training material	Jan 17, 2023
Introduction to Responsible Supervision,	relevance of supervision, mentoring, and role-modeling	Proactive and passive	Self-study and self reflection	Researchers and RI experts	No	Three different sub-modules provide an introduction to	Training manuals for trainers	Online training material	Jan 17, 2023



Mentoring and Role-modeling						mentoring and responsible supervision			
Exercises	Promotion of the moral character of researchers by using a virtue-ethics learning approach	Proactive	participatory sessions focus on creating connections between professional practices and codes of conduct	Researchers and RI experts	No	modules: debate–dialogue, virtues and norms, the middle position, Rotterdam Dilemma Game, and self-declaration approach	Training manuals for trainers	Face-to-face participation/online	Continuous update depending on the exercise

All materials can be found here: <https://embassy.science/wiki/Guide:Bbe860a3-56a9-45f7-b787-031689729e52>



## 5.7 Path2Integrity



**Description:** The overall purpose of the Path2Integrity training programme for educators (P2ITE) is to enhance educators' and teachers' competencies, confidence, and abilities to teach research integrity effectively, mainly by using the Path2Integrity learning materials and methods in an adaptive and sustainable way. This consists of innovative and fun learning and teaching methods including role-play and storytelling. P2ITE is divided in three parts. The first part introduces educators to the Path2Integrity project, followed by an introduction to research integrity and why it is important. Next, this part presents the methods and the underlying concepts used within the Path2Integrity learning materials. Lastly, educators are taught how to prepare, implement, and deliver the Path2Integrity learning materials in their educational context, enabling them to feel more confident when using the learning cards in their classrooms. In practice, Path2Integrity's learning goals cover different subfields of research integrity (research environment, research procedures, safeguards, collaborative work, citation and publication, mentoring, publishing and conflicts of interest, data practices, etc.; see [www.path2integrity.eu](http://www.path2integrity.eu)). They also show that the project takes the individual and societal perspective of dialogue into account. Path2Integrity identified the development stages of three different target groups (1. senior high school students, 2. university students, 3. early career researchers) and designed the Path2Integrity learning programme (P2ILC) with relevant stakeholders; the learning programme includes three handbooks of instruction and 27 learning cards (each representing learning sessions). Path2Integrity revised the P2ILC by drafting the materials, conducting lessons, collecting feedback, and redrafting the materials in 2019 and 2020.

Module	Learning goals	Teaching approach (proactive-passive)	Teaching approach (group-standalone)	Career-level customization	Disciplinary customization	Topic(s)	Training guide	Optional	Last update
Path2Integrity Training Programme for Educators	Enhance educators' and teachers' competencies, confidence, and abilities to teach research integrity	Proactive and passive	Self-study and self-reflection, collaborative learning	Educators in secondary schools	No	Introduction to RI, dialogical approach, how to deliver education using P2I materials	N/A	Online training material	N/A
Path2Integrity S-Learning Cards	Raise awareness on research integrity, promote norms, values and competencies of RCR, strengthen social interaction and dialogical competencies	Proactive	Both individual and collaborative learning	Secondary schools and bachelor's level	No	RI-related topics	Handbook available	Online training material	N/A
Path2Integrity M-Learning Cards	Raise awareness on research integrity,	Proactive	Both individual and collaborative learning	Master's students	No	RI-related topics	Handbook available	Online training material	N/A

	promote norms, values and competencies of RCR, strengthen social interaction and dialogical competencies								
Path2Integrity Y-Learning Card	Raise awareness on research integrity, promote norms, values and competencies of RCR, strengthen social interaction and dialogical competencies	Proactive	Both individual and collaborative learning	Early career researchers	No	RI-related topics	Handbook available	Online training material	N/A

All materials can be found here: <https://www.path2integrity.eu/ri-materials>



## 5.8 INTEGRITY

# iNTEGRITY

**Description:** INTEGRITY focuses on the *empowerment* of students and early career researchers, meaning that instead of seeking compliance, the project takes the building of capacities to detect, reflect, and act upon integrity issues in research practices as a starting point. Three core elements of empowerment are central. First, empowering students is about localisation; hence the project takes into consideration that students perceive and experience academic and research integrity issues differently throughout their career depending on their contexts. Students need to be able to develop a critical autonomy, i.e. a reflective attitude on their own practices and experiences. Therefore, students should be empowered to learn what academic and research integrity entails, following the definitions and principles stated in the European Code of Conduct for Research Integrity (ALLEA, 2017). At the same time, they should build their capacity to identify and critically reflect upon misconduct and questionable research and academic practices that they are likely to encounter. Empowerment stimulates a pro-active attitude in participants of the courses, helping them to actively address and deal with integrity issues they encounter in their studies or research.

Module	Learning goals	Teaching approach (proactive-passive)	Teaching approach (group-standalone)	Career-level customization	Disciplinary customization	Topic(s)	Training guide	Optional	Last update
Tool for high school students <a href="https://h2020integrity.eu/toolkit/ols-high-school-students/teachers-guide-for-secondary-school/">https://h2020integrity.eu/toolkit/ols-high-school-students/teachers-guide-for-secondary-school/</a>	Empowerment of the student to conduct responsible research.	Proactive	Self-study and self-reflection, collaborative learning	High schools	No	Animal experimentation; art, activism and awareness; data transmission; epidemiology; fast fashion; genetic testing; music; space exploration; technology	Teacher's guide	Online training material	N/A
Tool for undergraduate students <a href="https://h2020integrity.eu/toolkit/ols-undergraduate-students/integrity-games/">https://h2020integrity.eu/toolkit/ols-undergraduate-students/integrity-games/</a>	Raise awareness on research integrity, engage in interactive journey where they face a series of dilemmas about academic integrity.	Proactive	Self-study and self-reflection, collaborative learning	Bachelor's students	No	Integrity game: collaboration case; plagiarism case; qualitative data case; quantitative data case	Teacher's guide	Online training material	N/A
Tool for PhD students <a href="https://h2020integrity.eu/toolkit/ols-phd-students/">https://h2020integrity.eu/toolkit/ols-phd-students/</a>	Stimulate critical awareness regarding integrity issues in research practice.	Proactive	Self-study and self-reflection, collaborative learning	PhD students	No	Social safety, authorship, intellectual property, ensuring academic quality, supervision, data management, peer-review	Teacher's guide	Online training material	N/A

Tool for researchers and supervisors <a href="https://h2020integrity.eu/toolkit/tools-researchers-supervisors/">https://h2020integrity.eu/toolkit/tools-researchers-supervisors/</a>	Stimulate awareness of which issues are relevant in supervising and mentoring.	Proactive	Both individual and collaborative learning	Researchers and supervisors	No	Supervision and mentoring	No	Online training material	N/A
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### 5.9 BRIDGE



**Description:** These training materials are made up of guidelines, checklists, and games (online, board games, role play). Particularly interesting (for BEYOND) are the games. The training games use the “gamification” approach (see Task 6.3 of BEYOND) as a learning approach to raise awareness and provide very basic knowledge on RI, focusing on undergraduates and graduates.

Module	Learning goals	Teaching approach (proactive-passive)	Teaching approach (group-standalone)	Career-level customization	Disciplinary customization	Topic(s)	Training guide	Optional	Last update
<a href="#">Match up: Types of biases</a>	Improve awareness and knowledge	Proactive – Gamification	standalone	undergraduate /graduate	No	Types of bias	No	N/A	N/A
<a href="#">Hangman: CSR hangman</a>	Improve awareness	Proactive – Gamification	Standalone	undergraduate /graduate	No	N/A	No		

<a href="#">Balloon pop: Academic frauds</a>	Improve awareness and knowledge	Proactive – Gamification	Standalone	Undergraduate /graduate	No	Academic fraud	No		
<a href="#">Airplane: Relevant scientific sources</a>	Improve awareness and knowledge	Proactive – Gamification	Standalone	Undergraduate /graduate	No	Reference and citation	No		
<a href="#">Crossword / Ethical Citizen Science</a>	Improve awareness and knowledge	Proactive – Gamification	Standalone	Undergraduate /graduate	No	Citizen science	No		
<a href="#">Open the box: Test your knowledge of academic ethics</a>	Improve awareness and knowledge	Proactive – Gamification	Standalone/group	Undergraduate /graduate	No	Academic ethics	No		
<a href="#">Random wheel: Keywords from academic integrity</a>	Improve awareness	Proactive – Gamification	Standalone/group	Undergraduate /graduate	No	Academic integrity	No		

<a href="#">Wordsearch: Key words from business ethics</a>	Improve awareness	Proactive – Gamification	Standalone/group	Undergraduate/graduate	No	Business ethics	No		
Board game	Improve awareness	Proactive – Board game	Group	Undergraduate/graduate	No	Academic integrity	No		
<a href="#">Role-play publication ethics</a>	Improve awareness	Proactive – Role play	Group	Undergraduate/graduate/supervisors	No	Publication ethics	Yes		



## 5.10 ROSiE



**Description:** The ROSiE training materials will be aimed at the following groups of trainees: (i) students, (ii) early career researchers, (iii) experienced researchers, and (iv) citizen scientists. For each group of trainees in each field of science – natural sciences, social sciences, humanities, health and life sciences – we will develop customized training materials for a 2-day training course. The ROSiE consortium aims to develop a didactic framework which is learner-centred; based on interests, backgrounds, and learning styles of trainees; and ensures active and collaborative involvement in the learning process. To achieve optimal results, the ROSiE training materials will rely on several learning and teaching strategies that the authors consider most effective and useful for the purpose: (i) collaborative problem solving, (ii) case-based activities, (iii) dialogical activities, and (iv) transformative learning. (See D7.1- <https://rosie-project.eu/deliverables/>.)

Module	Learning goals	Teaching approach (proactive-passive)	Teaching approach (group-standalone)	Career-level customization	Training guide	Optional	Last update
1. Ethical and societal foundations of OS	(1) Demonstrate knowledge of ethical foundations of OS; (2) understand the significance of OS and citizen science for identifying and solving scientific problems and societal challenges	Passive and proactive	Home readings and Socratic seminar	Students, early career researchers, senior researchers	No	2-day training course	N/A
2. Protection of research participants' rights in OS	(1) Recognize and analyse the risks to research participants in the context of OS; (2) apply critical thinking skills – questioning, comparing, summarizing, drawing conclusions, and defending – to case studies on ethics and integrity in OS	Passive and proactive	Case discussion	Students, early career researchers, senior researchers	No	2-day training course	N/A
3. Ethical aspects of citizen science in the context of OS	(1) Understand the significance of citizen science for identifying and solving scientific problems and societal challenges	Passive and proactive	Home readings and group project	Students, early career researchers, senior researchers	No	2-day training course	N/A
4. Protection of intellectual property in the context of OS	(1) Enhance awareness of protection of intellectual property in OS; (2) enhance awareness of citizen scientists' right to be recognised and acknowledged by academic scientists and society; (3) apply critical thinking skills –	Passive and proactive	Case discussion	Students, early career researchers, senior researchers	No	2-day training course	N/A



	questioning, comparing, summarizing, drawing conclusions, and defending – to case studies on ethics and integrity in OS						
5. The quality of the research outputs and data sets	(1) Enhance awareness of importance of the quality of data sets and research outputs in OS and their responsible use; (2) apply critical thinking skills – questioning, comparing, summarizing, drawing conclusions, and defending – to case studies on ethics and integrity in OS	Passive and proactive	Home readings and case discussion	Students, early career researchers	No	2-day training course	N/A
5. The quality of the research outputs and data sets	(1) Understand the concept of conflict of interest and how to deal with it; (2) apply critical thinking skills – questioning, comparing, summarizing, drawing conclusions, and defending – to case studies on ethics and integrity in OS	Passive and proactive	Case discussion	Early career researchers, senior researchers	No	2-day training course	N/A
6. Responsible sharing and reuse of open social science data	(1) Enhance awareness of factors influencing willingness to share and use open research data	Passive and proactive	Brainstorming and group work	Students, early career researchers	No	2-day training course	N/A
6. Responsible sharing and reuse of open social science data	(1) Enhance awareness of factors influencing willingness to share and use open research data; (2) apply critical thinking skills – questioning, comparing, summarizing, drawing conclusions, and defending – to case studies on ethics and integrity in OS	Passive and proactive	Case discussion	Early career researchers, senior researchers	No	2-day training course	N/A
7. Prevention of research malpractice in	(1) Know potential types of research malpractice in the context of OS	Passive and proactive	Group work and plenary activity	Early career researchers, senior researchers	No	2-day training course	N/A

the context of OS							
7. Prevention of research malpractice in the context of OS	(1) Know potential types of research malpractice in the context of OS	Passive and proactive	Case discussion	Students, early career researchers, senior researchers	No	2-day training course	N/A
8. Responsible dissemination/publication practices	(1) Know criteria for good practice standards in open access publishing; (2) apply critical thinking skills – questioning, comparing, summarizing, drawing conclusions, and defending – to case studies on ethics and integrity in OS	Passive and proactive	Case discussion (Four Quadrant Method)	Students, early career researchers, senior researchers	No	2-day training course	N/A

**ROSiE- educational material for the social sciences**

Module	Learning goals	Teaching approach (proactive-passive)	Teaching approach (group-standalone)	Career-level customization	Training guide	Optional	Last update
1. Ethical and societal foundations of OS, its purpose	(1) demonstrate knowledge of ethical foundations of OS; (2) understand the significance of OS and citizen science for identifying and solving scientific problems and societal challenges	Passive and proactive	Home readings and Socratic seminar	students, early career researchers, senior researchers	No	2-day training course	N/A
2. Protection of research participants' rights in OS, protection of cultural heritage	(1) recognize and analyse the risks to research participants in the context of OS; (2) apply critical thinking skills - questioning, comparing, summarizing, drawing conclusions, and defending - to case studies on ethics and integrity in OS	Passive and proactive	Case discussion	students, early career researchers, senior researchers	No	2-day training course	N/A
2. Protection of research participants' rights in OS, protection of cultural heritage	(1) describe the risks to cultural heritage in the context of OS; (2) apply critical thinking skills - questioning, comparing, summarizing, drawing conclusions, and defending - to case studies on ethics and integrity in OS	Passive and proactive	Case discussion	students, early career researchers, senior researchers	No	2-day training course	N/A
3. Ethical aspects of citizen science in the context of OS	(1) understand the significance of citizen science for identifying and solving scientific problems and societal challenges	Passive and proactive	Home readings and group project	students, early career researchers, senior researchers	No	2-day training course	N/A
4. Protection of intellectual property in the context of OS	(1) be aware of protection of intellectual property in OS; (2) apply critical thinking skills - questioning, comparing, summarizing, drawing conclusions, and defending - to case studies on ethics and integrity in OS	Passive and proactive	Case discussion	students, early career researchers	No	2-day training course	N/A

5. The quality of the research outputs and data sets	(1) be aware of importance of the quality of data sets and research outputs in OS and their responsible use (2) apply critical thinking skills - questioning, comparing, summarizing, drawing conclusions, and defending - to case studies on ethics and integrity in OS	Passive and proactive	Home readings and case discussion	early career researchers, senior researchers	No	2-day training course	N/A
6. Responsible sharing and reuse of open humanities data	(1) be aware about factors influencing willingness to share and use open research data	Passive and proactive	Brainstorming and group work	students, early career researchers	No	2-day training course	N/A
7. Prevention of research malpractice in the context of OS	(1) know potential types of research malpractice in the context of OS	Passive and proactive	Group work and plenary activity	early career researchers, senior researchers	No	2-day training course	N/A
7. Prevention of research malpractice in the context of OS	(1) know potential types of research malpractice in the context of OS	Passive and proactive	Case discussion	early career researchers, senior researchers	No	2-day training course	N/A
8. Responsible dissemination/publication practices	(1) know criteria for good practice standards in open access publishing (2) apply critical thinking skills - questioning, comparing, summarizing, drawing conclusions, and defending - to case studies on ethics and integrity in OS	Passive and proactive	Case discussion (Four Quadrant Method)	students, early career researchers, senior researchers	No	2-day training course	N/A

### ROSiE- educational material for the humanities

Module	Learning goals	Teaching approach (proactive-passive)	Teaching approach (group-standalone)	Career-level customization	Training guide	Optional	Last update
1. Ethical and societal foundations of OS, its purpose	(1) Demonstrate knowledge of ethical foundations of OS; (2) understand the significance of OS and citizen science for identifying and solving scientific problems and societal challenges	Passive and proactive	Home readings and Socratic seminar	Students, early career researchers, senior researchers	No	2-day training course	N/A
2. Open science and data privacy in natural sciences	(1) Describe the risks to research participants, environment, plants, animals, and ecosystems in the context of OS; (2) apply critical thinking skills – questioning, comparing, summarizing, drawing conclusions, and defending – to case studies on ethics and integrity in OS	Passive and proactive	Case discussion	Students, early career researchers, senior researchers	No	2-day training course	N/A
3. Ethical aspects of citizen science in the context of OS	(1) Understand the significance of citizen science for identifying and solving scientific problems and societal challenges	Passive and proactive	Home readings and group project	Students, early career researchers, senior researchers	No	2-day training course	N/A
4. Protection of intellectual property in the context of OS	(1) Enhance awareness of protection of intellectual property in OS; (2) enhance awareness of citizen scientists' right to be recognised and acknowledged by academic scientists and society; (3) apply critical thinking skills – questioning, comparing, summarizing, drawing conclusions, and defending – to case studies on ethics and integrity in OS	Passive and proactive	Case discussion	Students, early career researchers, senior researchers	No	2-day training course	N/A

5. The quality of the research outputs and data sets	(1) Enhance awareness of importance of the quality of data sets and research outputs in OS and their responsible use; (2) apply critical thinking skills – questioning, comparing, summarizing, drawing conclusions, and defending – to case studies on ethics and integrity in OS	Passive and proactive	Home readings and case discussion	Students, early career researchers	No	2-day training course	N/A
5. The quality of the research outputs and data sets	(1) Understand the concept of conflict of interest and how to deal with it; (2) apply critical thinking skills – questioning, comparing, summarizing, drawing conclusions, and defending – to case studies on ethics and integrity in OS	Passive and proactive	Case discussion	Early career researchers, senior researchers	No	2-day training course	N/A
6. Responsible sharing and reuse of open social science data	(1) Enhance awareness of factors influencing willingness to share and use open research data	Passive and proactive	Brainstorming and group work	Students, early career researchers	No	2-day training course	N/A
6. Responsible sharing and reuse of open social science data	(1) Enhance awareness of factors influencing willingness to share and use open research data; (2) apply critical thinking skills – questioning, comparing, summarizing, drawing conclusions, and defending – to case studies on ethics and integrity in OS	Passive and proactive	Case discussion	Early career researchers, senior researchers	No	2-day training course	N/A
7. Prevention of research malpractice in	(1) Know potential types of research malpractice in the context of OS	Passive and proactive	Group work and plenary activity	Early career researchers, senior researchers	No	2-day training course	N/A

the context of OS							
7. Prevention of research malpractice in the context of OS	(1) Know potential types of research malpractice in the context of OS	Passive and proactive	Case discussion	Students, early career researchers, senior researchers	No	2-day training course	N/A
8. Responsible dissemination/publication practices	(1) Know criteria for good practice standards in open access publishing; (2) apply critical thinking skills – questioning, comparing, summarizing, drawing conclusions, and defending – to case studies on ethics and integrity in OS	Passive and proactive	Case discussion (Four Quadrant Method)	Students, early career researchers, senior researchers	No		

**ROSiE- educational material for the natural sciences**

Module	Learning goals	Teaching approach (proactive-passive)	Teaching approach (group-standalone)	Career-level customization	Training guide	Optional	Last update
1. Ethical and societal foundations of OS, its purpose	(1) demonstrate knowledge of ethical foundations of OS; (2) understand the significance of OS and citizen science for identifying and solving scientific problems and societal challenges	Passive and proactive	Home readings and Socratic seminar	Students, early career researchers, senior researchers	No	2-day training course	N/A
2. Protection of research participants' rights in OS	(1) recognize and analyse the risks to research participants in the context of OS; (2) apply critical thinking skills - questioning, comparing, summarizing, drawing conclusions, and defending - to case studies on ethics and integrity in OS	Passive and proactive	Case discussion	Students, early career researchers, senior researchers	No	2-day training course	N/A
3. Ethical aspects of citizen science in the context of OS	(1) understand the significance of citizen science for identifying and solving scientific problems and societal challenges	Passive and proactive	Home readings and group project	Students, early career researchers, senior researchers	No	2-day training course	N/A
4. Protection of intellectual property in the context of OS	(1) be aware of protection of intellectual property in OS; (2) be aware of citizen scientists' right to be recognised and acknowledged by academic scientists and society; (3) apply critical thinking skills - questioning, comparing, summarizing, drawing conclusions, and defending - to case studies on ethics and integrity in OS	Passive and proactive	Case discussion	Students, early career researchers, senior researchers	No	2-day training course	N/A



5. The quality of the research outputs and data sets	(1) be aware of importance of the quality of data sets and research outputs in OS and their responsible use (2) apply critical thinking skills - questioning, comparing, summarizing, drawing conclusions, and defending - to case studies on ethics and integrity in OS	Passive and proactive	Home readings and case discussion	Students, early career researchers	No	2-day training course	N/A
5. The quality of the research outputs and data sets	(1) understand the concept of conflict of interest and how to deal with it; (2) apply critical thinking skills - questioning, comparing, summarizing, drawing conclusions, and defending - to case studies on ethics and integrity in OS	Passive and proactive	Case discussion	Early career researchers, senior researchers	No	2-day training course	N/A
6. Responsible sharing and reuse of open social science data	(1) be aware about factors influencing willingness to share and use open research data	Passive and proactive	Brainstorming and group work	Students, early career researchers	No	2-day training course	N/A
6. Responsible sharing and reuse of open social science data	(1) be aware of factors influencing willingness to share and use open research data (2) apply critical thinking skills - questioning, comparing, summarizing, drawing conclusions, and defending - to case studies on ethics and integrity in OS	Passive and proactive	Case discussion	Early career researchers, senior researchers	No	2-day training course	N/A
7. Prevention of research malpractice in the context of OS	(1) know potential types of research malpractice in the context of OS	Passive and proactive	Group work and plenary activity	Early career researchers, senior researchers	No	2-day training course	N/A



7. Prevention of research malpractice in the context of OS	(1) know potential types of research malpractice in the context of OS	Passive and proactive	Case discussion	Students, early career researchers, senior researchers	No	2-day training course	N/A
8. Responsible dissemination/publication practices	(1) know criteria for good practice standards in open access publishing (2) apply critical thinking skills - questioning, comparing, summarizing, drawing conclusions, and defending - to case studies on ethics and integrity in OS	Passive and proactive	Case discussion (Four Quadrant Method)	Students, early career researchers, senior researchers	No	2-day training course	N/A

**ROSiE- educational material for the life sciences and medicine**

## 6. REFERENCES

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