ARPHA Preprints

PENSOFT

Guidelines

Posted on 30/03/2021

DOI: https://doi.org/10.3897/arphapreprints.e66720

Path2Integrity Learning Cards & Handbook for Trainers and Lecturers: Y-Series

Julia Prieß-Buchheit, Lisa Häberlein, Tom Lindemann

Path 2 Integrity

Handbook for Trainers and Lecturers

Integrity in Research and Society

Y-Series

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824488.

Acknowledgement

The authors would like to thank

Arja R. Aro, Dick Bourgeois-Doyle, María del Carmen Bernal González, Cheng-Chen Chen, Iliyana Demirova, Agnieszka Dwojak-Matras, Martina Felst, Nicole Föger, Margarita Grudova, Jacques Guerette, Mette Winge Jakobsen, Katarzyna Kalinowska-Sinkowska, Agnieszka Koterwas, Peter Krope, Michael Kulik, Dirk Lanzerath, Tom Lindemann, Belén López, Erika Löfström, Teodor Metodiev, Katharina Miller, Simson Mwale, Dennis Niesel, Maria Palianopoulou, Erik Rading, Anna Sapundzhieva, Jochen Schaefer, Julius Späte, Christiane Stock, Nick Vilter, Adrian Vogt, Nicolaus Wilder, Linda Zollitsch

Members of ENRIO *European Network of Research Integrity Offices*

Members of ENERI European Network of Research Ethics and Research Integrity

Participants at “Wissenschaftliches Arbeiten Lehren und Lernen“

and many students

for constructive feedback and comments

as well as Holly McKelvey for the design.

Contents

List of figures

List of abbreviations

P2I	Path2Integrity
P2ILC	Path2Integrity learning cards
ECoC	The European Code of Conduct for Research Integrity

The purpose of the Path2Integrity handbook

Do you want to teach researchers how to clarify their own role in research, as well as help them understand how important reliable research is for society? This handbook accompanies the **Path2Integrity learning cards (P2ILC)** on eight topics (https://www.path2integrity.eu/ri-materials) and introduces you to an easy and fun learning programme that has been evaluated in over 20 training sessions. The Path2Integrity learning cards Y-series is especially designed for early career and active researchers to learn how responsible research must necessarily be conducted in order to be reliable and in this sense useful for society.

Therefore, the Y-series learning cards help researchers find solutions to difficult questions of research integrity and share experiences in difficult situations while understanding the research landscape and processes within it, and by appreciating the importance of research integrity's criteria for society (cf. Häberlein 2020, 12f.). With the aid of many experienced teachers and lecturers, the authors collected tips in this handbook on how to prepare each card, how to support the researchers' learning curve, and how to overcome the various challenges that might arise as you bring this important topic to your participants.

In the next chapters, this handbook helps you prepare and carry out lessons on what makes for good, reliable research with the following learning cards (Fig. 1).

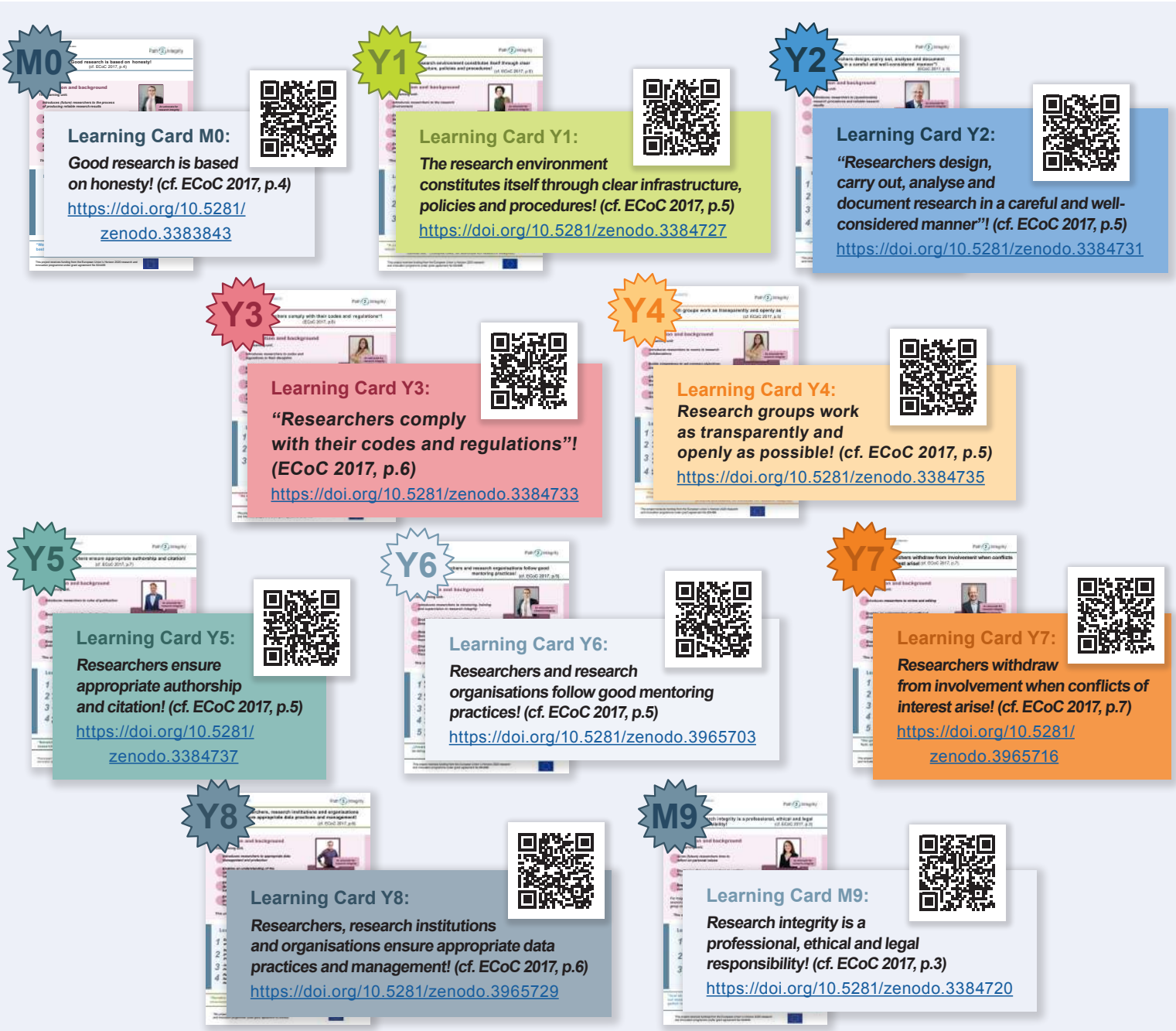


Figure 1: The Path2Integrity Y-series learning cards

What the Path2Integrity learning card programme offers

The Path2Integrity learning card programme empowers people to present and discuss issues in a logical manner and to make evidence-based decisions that follow principles of open, honest, and dependable scientific research themselves. Each card can be used in a session of up to two hours to encourage dialogue, adopt different perspectives and get creative. You can use the cards as a guide for teaching a lesson or as an exercise sheet in the course. Furthermore, the length of the exercises and sessions can be adapted to meet the particular needs of your participants; the flexibility of the programme allows you to choose and incorporate individual cards or select exercises from them that you consider suitable for your teaching area (Fig. 2).

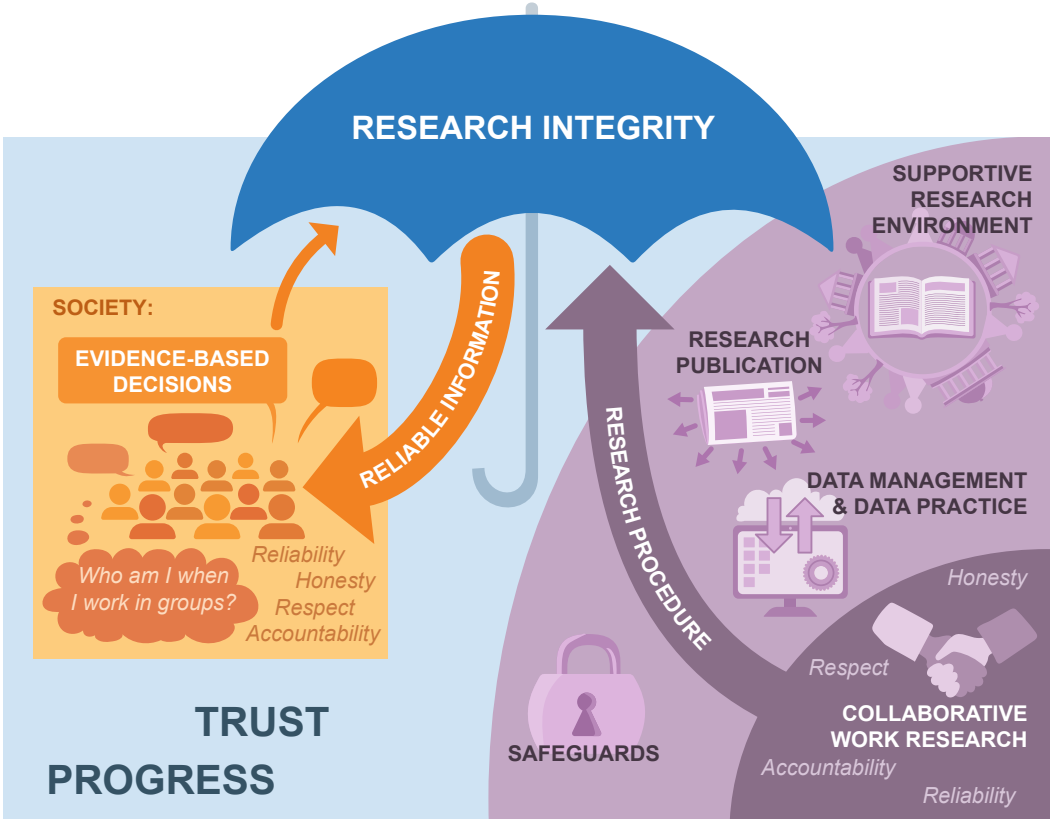


Figure 2: Integrity in research and society

> "I introduced my participants to the subject of research procedures when I used the cards in a course for doctoral candidates in 2019. As post-graduates they were already experts in their fields of research, and had an understanding of research integrity. They could immediately see the connection in terms of research integrity and their own research activity. We discussed which focus they currently have in their respective research project and which procedures play a role. They realised that they themselves, as part of the research community, follow certain principles that guarantee good research and reliable research results.

As a cornerstone of the Path2Integrity learning card programme, researchers "[...] learn how to conduct a dialogue on the rejection or acceptance of norms in research integrity"[1]; in other words, they learn how to argue in favour of practices and principles that ensure good, reliable research results. To support them in this process, you can adapt the learning cards to your and your participants' cultural and religious backgrounds. The following chapters show you how to foster your participants' understanding of good research practice and its importance to society by using the Path2Integrity learning cards from the Y-series. If you are interested in material prepared for secondary school students and undergraduates or graduates, switch to the handbook for the S-series for pre-disciplinary settings or the M-series for disciplinary settings.

The Path2Integrity learning cards highlight student-centred interactions that help participants address challenging questions through role-playing, storytelling and reaching an agreement with one another. By using Path2Integrity learning cards, you enable researchers to develop their own standpoint based on sound arguments, and to be able to demand integrity in research and society.

1 Prieß-Buchheit et al. 2020, 23, https://doi.org/10.3897/rio.6.e53921.

> The design of the cards and the step-by-step procedure especially motivated participants when I used four learning cards from the Y-series last semester. They also liked the active exercises, and found these exciting and engaging. In the session "Researchers design, carry out, analyse and document research in a careful and well-considered manner", I outlined the exercises from the sheet in detail and made reference to the researchers' prior experience in my explanations in order to help them relate to the topic. When we started to do the role-playing, this encouraged people to reconsider their own research practices in detail. It made me realise what professionals they already are. I just supported them whenever questions arose; that has helped a great deal.

What is research integrity?

Lex Bouter, Professor of Methodology and Integrity at Amsterdam University Medical Centers describes research integrity as concerned with the behaviour of individual researchers. It is about research conduct and in this context about behaviour that affects trust in science or trust between scientists.

"Research integrity has obviously some overlap with research ethics and both of these concepts have some overlap with, what we call in Europe, responsible research and innovation, which is the societal relevance. [...] We call that responsible conduct of research. It's research that's relevant, that's valid, that's reproducible and also efficient".

Amsterdam Scholarly Summit, 2. July 2019 (http://editorresources.taylorandfrancis.com/wp-content/uploads/2019/07/What-is-research-integrity-Transcript.pdf).

How to prepare your teaching with the Path2Integrity learning cards

To orientate yourself and to prepare Path2Integrity learning card sessions, the **first page** of each card tells you what the respective learning card is about (Fig. 4). Using the Path2Integrity learning card gives you both structure for your session as well as additional information for composing your lesson individually. With the cards, the time you save preparing your lesson can then be used to adapt the tasks, subfields and phases to your group, allowing them to dive deeper into the topic.

Before you go into a Path2Integrity learning card session you should:

1. be acquainted with the card;
2. know the story: *Hannah's protocol – Is there a need for a research integrity policy?;*
3. be familiar with a code of conduct for research integrity; and
4. have a plan how to navigate your group through the card.

The **Heading** outlines the main topic of the session.

The **Description and background** box describes the broader spectrum of the learning content.

Research integrity **role models** can serve as orientation and identification. Significant statements from advocates for research integrity can be taken up and discussed in the session.

The **Learning Stages** box outlines the different phases of the session, as well as the different classroom interactions they entail.

The **Learning Objectives** box outlines a series of expected skills that should be achieved through the P2ILC sessions; these skills will enable students to engage in dialogue surrounding norms within various subfields of reliable research results (such as research procedures, complying with codes and regulations, and academic writing).

Figure 3: Path2Integrity learning card first page

> When I started using the P2I learning cards in November 2019, II realised that they contained more information and possibilities than I had expected. By reading the **first page** of each card, I encountered various topics surrounding integrity in research and society. I watched the short introductory video for the Y-series (https://www.youtube.com/watch?v=ft-datvhmfo) and read the backgrounds and learning objectives on each card. With so many cards at hand, I was initially overwhelmed by the variety until I saw that each card had a heading, which described the main topic of each session.
>
> What I like about the programme is the wide range of topics and the flipped-classroom style with reading preparations, in which my learning group was prompted prior to our session to acquaint themselves with the upcoming topic. Because each card outlines which articles, videos, cartoons etc. will help me best prepare my participants, my only task was to inform them what to read. In just three minutes, I had sent my group the task via email. This gave me time to consider extra material and adjust the card to the needs of my course. For my first try with the P2ILC, I chose the card "The research environment constitutes itself through clear
>
> infrastructure, policies and procedures!" and started to prepare myself with the help of the second page. I worked it through, thought about how I could lead my course through the card's various exercises and tasks using their specific knowledge and habits, and made a copy of the second page for each participant.
>
> As my participants were rather inhibited in performing the exercises, I supported them by limiting the perspective of the research environment to our institution and decided to start with a joint brainstorming on our research landscape to ease them into a good working mood. Since they needed a little assistance, I provided examples related to the different roles in exercise three and four so that researchers could identify specific stakeholders. It worked out great and helped get my participants into a creative mood.
>
> The session was a complete success! In class we introduced ourselves to Hannah, Rory and the various members at the conference, and performed an engaging storytelling exercise about the possibilities of promoting research integrity. Using the card, we got to know our research infrastructure, rules and procedures in detail and were able to identify possible gaps. I enjoyed how much fun we had, and continued using the cards in future courses.
>
> After the third session, participants began to anticipate the learning routine, even starting to regulate themselves and creating ideal learning opportunities. I was really able to become a mediator of their learning! In two subsequent sessions, I changed the phases to include longer discussions, after seeing how eager my course was to exchange their thoughts and arguments.

Figure 4: QR code link to the introductory video of the P2I Y-series learning cards

How to help participants use the card and adapt it to your teaching

I. You can flip your classroom

Each learning card contains a self-paced preparation phase. **Thus, you can divide each learning session into two phases:**

1. **the individual preparation phase**; and
2. **the classroom training**.

> Whenever I asked my participants to study learning material at home, I carefully selected and prepared the material to avoid overloading them. I wanted my course to engage with the subject without losing motivation[2]. It's great that the P2ILC already contain material that I could supplement with guiding questions. I'm lucky that the participants of my course are used to doing some learning at home, meaning we had more time for the interactive sessions in class.

If you want, you can change the flipped classroom into a reading session at the beginning of the lesson. **When selecting material, please take into account that each participant needs to be able to access it.**

In the description of each learning card, the authors prepared additional material that you can use for the preparation phase (see the section **"Ten sessions on integrity in research and society"** on page 12 of this handbook). For more information on how to flip your classroom, as well as on how to supplement the learning material, please refer to the Path2Integrity road-map (https://www.path2integrity.eu/teaching-RI Fig. 5).

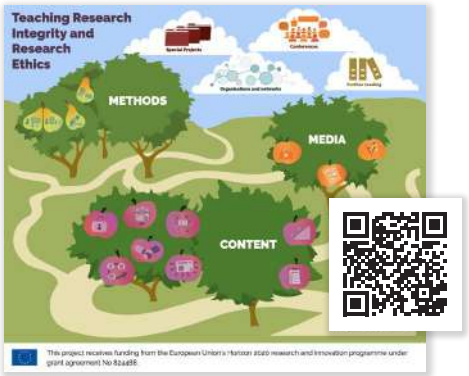


Figure 5: Path2Integrity roadmap

2 For further information see Nimmerfroh 2016.

II. You can introduce Hannah's protocol – Is there a need for a research integrity policy?

Hannah's protocol – Is there a need for a research integrity policy? is a narrative from the Path2Integrity learning card programme, in which reliable research results are at stake. The narrative is introduced in M0 and subsequently used in each card while developing in different directions.

> The **story** of Hannah and Rory at the conference meeting, which is used in many of the cards, fascinated us. From session to session, participants identified with the characters and imagined as well as relived their adventures. In particular, my participants loved the pink sections of the learning cards, which emphasise taking a dialogical approach to Hannah's protocol.

With *Hannah's protocol – Is there a need for a research integrity policy?*, you can reflect as well as express different points of view and start a reciprocal learning process. If you want, you can use the visually appealing graphic (https://zenodo.org/record/3384746#.XySdZedCSUk) at the beginning of each session. To ensure that your participants understand the narrative, **you can ask them to describe the story in their own words** and to articulate what integrity challenge is being described: namely, a familiar problem of conflicting motivations, in which good scientific practice is weighed against other inclinations and incentives such as obedience, hierarchy, structural forces or more (Fig. 6).

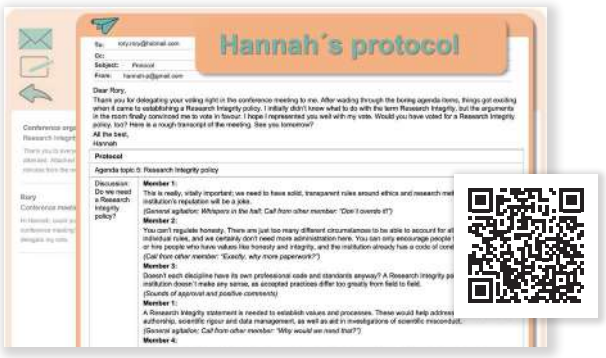


Figure 6: Hannah's protocol – Is there a need for a research integrity policy?

3 Nussbaum 1997, 85 and 95.
4 cf. Frank and Osbeck 2016; Nussbaum 1990; Nussbaum 1997; Phillips 2010; Zipes 2005.
5 cf. Nussbaum 1990, 5.

III. You can encourage storytelling

Storytelling can increase "sympathetic imagination"[3], ethical reflection and comprehension of others, as well as vivid, reflective and experiential responses.[4] Through storytelling, researchers can acquire knowledge, develop solutions to a problem together and build a common language by expressing realities of human experience through the art of narrative.[5]

In the storytelling exercises contained in the P2ILC, participants articulate how they interpret concepts like research integrity or how occurrences of e.g. mistrust can influence their point of view. Using their own words and expressing both common and diverse views, they tell short stories e.g. about different author sequence rules, the possibility of fostering research integrity in the research landscape or appropriate data management and protection.

Learning with storytelling invites students to step away from their own feelings and subjective attitudes and to begin developing a common language by "thinking aloud" and exchanging different points of view.

Figure 7: Storytelling

> When we reviewed what Hannah's protocol entailed, the researchers noticed that Hannah had participated in a meeting in which the need for research integrity policies with respect to different motivations was discussed. For my course, it was evident that different parties have taken opposing positions in this matter and were presenting conflicting arguments due to their diverse motivations. They understood that the main characters had no fundamental problem in terms of ethical orientation, and that they actually knew what was morally right to do. Nevertheless, they experienced a situation in which other incentives put research integrity at stake.
>
> When they were asked to engage in story-telling in Y8, my course listened to different statements from their peers, outlined their knowledge, and started to discuss procedures of data management and protection in the context of Hannah's protocol. They began to develop and rationalise their own arguments for the importance of good data practices in research and society.

> When I asked participants in my course to write a short story about the joint publication of an interdisciplinary research group in our Y5 session, they got really into it, referring to responsibility for the content, sequence of authorship or disclosure of conflicts of interest. Researchers enjoyed taking up specific topics of publication and diving into the story.
>
> At one point, I intervened and pointed out that '*Hannah's protocol - Is there a need for a research integrity policy?*' and its continuation is a fictional narrative that can develop in different ways, so they put their stories into various contexts. The discussion between peers from different disciplines was enriching and solved some uncertainties! Working in small groups, they found themselves at the centre of a process in which both interaction and problem-solving skills were required.

IV. You can promote role play

Role-playing is an exploratory game in which participants assume an "as-if character".[6] Through role play you promote classroom participation, awareness of the complexities of ethics, critical and reflexive thinking, application of concepts, emotional engagement and personal accountability.[7]

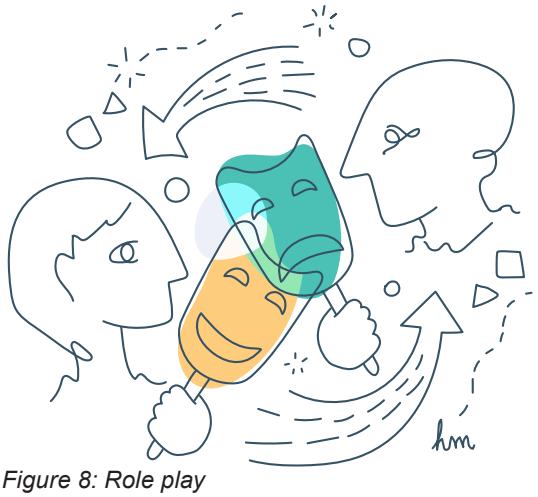


Figure 8: Role play

6 Fürstenau 2015, 106 [translated by Lisa Häberlein].
7 cf. Löfström 2012, 349 in reference to Clarkburn 2002, Sirin et al. 2003, Sparks and Hunt 1998, DeNeve and Heppner 1997; Grose-Fifer 2017; Löfström 2016; McCarthy and Anderson 2000; McWilliams and Nahavandi 2006; Poling and Hupp 2009; Poorman 2002; Rosnow 1990; Strohmetz and Skleder 1992.

To get started with role play in the Path2Integrity learning cards, you can orientate yourself using the following steps:

1. Preparation: **You know your learning group best**. Get them in the right mood thematically and emotionally. Read the instructions together and help your participants identify with their role. Offer them a comprehensive picture of the situation. You can also describe characteristics of the role to be played in detail.[8]
2. Performing: **Provide ample space for the role-playing scenario**, making sure to give your students enough time as well. If necessary, you can also provide a start signal or assign moderators to take over a guiding function in the role play.
3. Reflection: Make sure that you plan in at least as much time to reflect the role play as for the role play itself. Gradually guide your course out of the scenario by allowing them to summarise and evaluate what they have experienced[9]. Follow the instructions from the P2ILC or invite your students to share what they have observed in the play, and how they have judged decisions and interpreted the actions of others. Finally, evaluation of the role play should focus on how your participants can apply these concepts in future, and use them to argue in favour of evidence-based decisions and good research practice. If necessary, provoking questions about honesty, accountability, respect and reliability in research can stimulate a reflective analysis of the players' behaviour and their reasoning for it.

8 cf. Fürstenau 2015, 96.
9 cf. Fürstenau 2015, 104.

> It is this experience of putting oneself into different roles that helped my course develop a deeper understanding of their own and others' positions, and to acknowledge conditions for a research integrity dialogue by taking an active approach. I liked that the role play imparts technical knowledge by directly referencing sources such as '*The European Code of Conduct for Research Integrity*'.
>
> One challenge, however, was to ensure that participants thoughtfully addressed the learning content of learning card Y3 "Researchers comply with their codes and regulations". Out of shyness towards others or perhaps due to overload, time and again roles were exaggerated or poorly presented. I decided to pause the role play and invite my course to spend some time discussing the screenplay. I asked them to imagine a situation of research misconduct in which they need to switch to help mechanisms. Who can provide help and how? What are the consequences? Why would this or that action be good or bad for science and society? We discussed which rules and regulations ensure good scientific practice. This allowed my participants to delve into the scenario more deeply. We tried the role play once again and it worked much better.

V. Refer to a code of conduct for research integrity

The Path2Integrity project uses *The European Code of Conduct for Research Integrity* (ECoC) as a reference document. It provides clear guidelines and reference points for orientation in the research community. By referring to the ECoC, researchers are able to recognise standards of good research as such and refer to them in specific cases when they need guidance. This document, like other codes of conduct, serves as a basis for regulating one's own behaviour; this makes it possible to avoid thinking in terms of relativism when evaluating research behaviour through a moral lens. Depending on your cultural and disciplinary requirements, you may refer to the ECoC or choose other national, institutional or disciplinary codes of good research practice within your area of teaching that seem most appropriate for your group.

It is important to remember that the code of conduct you choose to refer to should not be used dogmatically, but rather should serve to orientate participants towards basic principles of good research practice.

VI. Evaluating students' knowledge and ability to defend good scientific practice

Over the lifetime of the project, the Path2Integrity learning card programme additionally includes one card each for pre- and post-testing (M0 and M9). If you prefer to evaluate without the cards, you can use the following two links (Fig. 9):

Pre-test:
https://path2integrity.eu/limesurvey/index.php/238122?newtest=Y&lang=en

Post-test:
https://path2integrity.eu/limesurvey/index.php/238122?newtest=Y&lang=en

Figure 9: Pre-test & Post-test evaluations

The pre- and post-tests each take approximately 15 minutes. The test evaluates the effectiveness of the learning cards in your course and examines in open and closed questions (1) how to act as a researcher, e.g. how to manage data or where to go to report misconduct; and (2) how to argue in favour of good scientific research, e.g. to achieve systematic and accessible knowledge or to make one's work more transparent.

The test examines the researchers' points of view on what makes for good and reliable research. Comparing results from the pre- and post-tests will illuminate any changes in the students' knowledge and patterns of argument that have emerged during the course of using the learning cards. As indicated in learning card M9, you only need to send an email to evaluation@path2integrity.uni-kiel.de to receive your results. The anonymised results are indicators of how your students on average (not at an individual level) argued in favour of good scientific practice both before and after P2I sessions.[10]

The P2I project recommends starting with M0 and ending your teaching with M9 if you intend to use three or more learning cards. As a trainer you can also give feedback on what obstacles you encountered in your sessions or what made you and your students particularly enthusiastic about

10 cf. Wilder et al. 2020, 15.

the learning cards. This feedback will help to identify your trainer-specific needs in the classroom and to develop the programme further. Use this link: https://path2integrity.eu/limesurvey/index.php/593973?lang=en

If you would like to find out how the participants' experience was, you can have everyone fill out the smiley face questionnaire at the end of your P2I courses: https://path2integrity.eu/limesurvey/index.php/553522?lang=en

How to support a dialogical learning setting

The Path2Integrity learning cards use dialogical methods to provide an active and sustainable learning environment. The sections marked in pink on the exercise sheets indicate that participants will engage in storytelling, role-playing or reaching an agreement. In these sections, researchers are challenged in various contexts to provide rational arguments, set common goals and norms, request that someone do something, establish preconditions for a dialogue and weigh both pros and cons of different actions. To this end, participants need to show a certain amount of tolerance for ambiguity, communicate openly, listen actively and trust one another.

It can sometimes be difficult to create an atmosphere in which dialogical methods can be successfully pursued. Holding the lesson in a room that is large enough for interactive sessions and which allows chairs and desks to be removed can provide a supportive surrounding; as well as letting participants sit together (though not in front of one another) and providing everyone with the same materials, e.g. exercise books, pencils etc. It is possible to hold these sessions online. Just use a tool that supports breakout sessions, like for example the online teaching platform of Path2Integrity, which you can find here: https://learning-p2i.eu/

If participants are not used to actively contributing, trainers can facilitate a smooth transition into the exercise by allowing the researchers to choose between being an observer or player during the dialogical exercises, thus giving participants time to adjust. In such sessions the tasks highlighted in pink on the learning cards are conducted by players, while observers closely watch one or two groups and subsequently write down what they learned from the presentations of others with regard to the key message from the heading of the respective card, e.g. ***Researchers ensure appropriate authorship and citation!***

In case you notice shortcomings in the dialogues of groups that are struggling to perform the tasks highlighted in pink, you can discuss all or some of the following rules with your course to take a new direction[11]:

1. Be ready to have a dialogue about accepting or rejecting norms.
2. Make sure that everyone can participate in the dialogue.
3. Acknowledge each contribution to the discussion as a noteworthy argument.

11 These are nine out of 14 rules on how to conduct a rational dialogue (cf. Klare and Krope 1977, 124).

The dialogical approach to teaching students about what is necessary to produce reliable research results and evidence-based decisions in society: a closer look.

According to Lorenz (2005, 189–191), a dialogue is a verbal discussion between two or more people, characterised by speech and counter-speech with the following specifics: question and answer (to clarify terms), claim and counter-claim (to justify decisions), and proof and falsification (to disclose inferences). A dialogue is a high-quality interpersonal relationship (cf. Widdershoven and Solbakk 2019) and seeks to be an ideal speech situation (cf. Habermas 1990, 43–115) in which the other (›you‹) is recognised as a person, instrumentalisation is renounced, others' right to differing opinions is taken seriously, and an **I** and **you** role can be clearly defined (cf. Lorenz 2005, 189–191). When impartial, unconstrained and non-persuasive acts are respected, a dialogue can be conducted (cf. Gethmann 2005, 191).

A dialogical approach in teaching and learning builds common language and enables participants to answer questions and develop solutions. It can be successful when equal rights and obligations for all parties are ensured and power-driven assertions, threats, deceptions and promises that cannot be fulfilled are eschewed (cf. Janich 2009, 20–21).

A piece of advice from gender expert Katharina Miller:

One challenge within dialogical learning settings can be the lack of eye-level conversations between different genders. Within the Path2Integrity project, the gender dimension has been observed to play a role in interactive sessions. "Storytelling and role play are often gender-mixed interactions in classrooms, incorporating gender-specific interaction patterns. Because women have less speech percentage and more speech interruptions in gender-mixed discussion groups […]"[12] P2I suggests teachers be aware of these (usually unconscious) power structures. That is why we recommend that you empower men and women to "[…] unfold their different emotions connected to their experiences"[13] by raising their awareness of existing differences and supporting their individual approaches towards participating in the dialogical discussions. This could be accomplished through an awareness training before the use of the learning cards starts. I am happy to accompany your learning experience. You can send an email to miller@3ccompliance.com and I will provide you with more information.

12 Prieß-Buchheit et al. 2020, 20.
13 Prieß-Buchheit et al. 2020, 20.

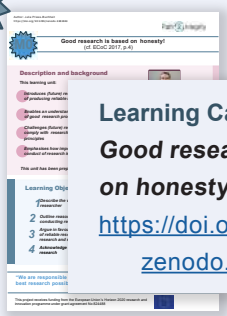
4. Share your prior knowledge when required and be prepared to discuss it.
5. Do not call upon someone's prior knowledge when you have rejected it yourself as unacceptable.
6. Do not stick to an opinion in the face of better information; accept stronger arguments.
7. Do not use an ambiguous argument to convice someone.
8. Remember that your social status does not replace making a good argument.
9. Be ready to provide reasons for your statements if asked to do so.

How to improve the learning curve

To improve the learning curve, the Path2Integrity project recommends using a **learning journal** after each session. To implement a learning journal in your Path2Integrity teaching, you can follow these steps:

1. Review the learning objectives box on the respective Path2Integrity learning card.
2. Create a writing prompt for your students that requires them to summarise the lesson. Start the prompt with, **"Write between five and ten sentences starting with the words *'how did you…'*"**
3. Then list the objectives of the respective card, e.g. from card Y5:
   - ***a) explain the rule of author sequences from your discipline;***
   - ***b) compare different rules of author sequences between disciplines;***
   - ***c) accept different publication rules;***
   - ***d) acknowledge the purpose of publication in research.***
4. To conclude the prompt, add **"…in our session today? Can you draw any references and links between the actions of the session and theories, findings or methods, you already know? What do you think about when transferring these actions to a broader scale?"**
5. Provide your course with the writing prompt at the end of the session and decide when they need to return their response.

Ten sessions on integrity in research and society



Learning Card M0:
***Good research is based on honesty!* (cf. ECoC 2017, p.4)**
https://doi.org/10.5281/zenodo.3383843

This learning card **introduces** future researchers to how important the responsible conduct of research is for society. The exercises introduce research and how reliable research results are produced, and enable an understanding and usage of research results in our knowledge-based society. In six learning steps, participants learn basic values that characterise good research, formulate reasons for reliable research by telling stories and find arguments for trustworthy research results for science and society. **This learning card is best used to start the P2ILC programme.** Using the pre-test linked on the card, you can test for improvement in your courses. Feel free to use the test as an opportunity to discuss where reliable research results are at stake.

Links from learning card M0:

Evaluation of the learning units: https://path2integrity.eu/limesurvey/index.php/714871?newtest=Y&lang=en

Figure 11: M0 learning card

Learning Card Y1:
The research environment constitutes itself through clear infrastructure, policies and procedures!! (cf. ECoC 2017, p.5)
https://doi.org/10.5281/zenodo.3384727

This learning card familiarises researchers with their institutional infrastructure and enables an understanding of the relationship between research environment and good research practices. In five learning steps, participants explain and justify important norms from their research environment, depict roles and responsibilities and use research infrastructure, policies and procedures in storytelling.

Links from learning card Y1:

The European Code of Conduct for Research Integrity: https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf

If it works for your course, you can also use the following additional material:

The Research Integrity Office (ORI) provides an infographic on a "publish or perish" case study that highlights different levels of responsibility in the research environment: https://ori.hhs.gov/sites/default/files/2018-04/1_Everyone_Plays_a_Role.pdf

> "During my Path2Integrity session with early career researchers who are currently doing their doctorates, I noticed that they already perceive themselves as part of the research community and know the structures of the research landscape quite well. We therefore focused on examining their own needs in the lab or other research settings.

Figure 12: Y1 learning card

Y2

Learning Card Y2:
Researchers design, carry out, analyse and document research in a careful and well-considered manner!
(cf. ECoC 2017, p.5)
https://doi.org/10.5281/zenodo.3384731

This learning card introduces researchers to research procedures that are necessary for careful and well-considered research and for producing reliable results. In five learning steps, participants explain and justify the criteria of responsible research. In role play they compare research processes in different fields that are important from idea to publication in order to ensure research integrity. They are able to endure other points of view and adapt their own positions while they evaluate different arguments, face dissent and achieve consensus.

Figure 13: Y2 learning card

Links from learning card Y2:

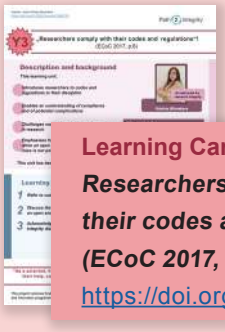
The European Code of Conduct for Research Integrity: https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf

If it works for your course, you can also use the following additional material:

The Economic and Social Research Council (ESRC) helps researchers consider ethics issues throughout the complete life cycle of a project. Case studies, listed under a specific ethics issues category, aim to raise awareness of some of the ethics issues that can arise in research. https://esrc.ukri.org/funding/guidance-for-applicants/research-ethics/ethics-case-studies/

> "The speed-dating in the Y2 learning card was just great! It was so much fun and encouraged discussion and self-reflection of one's own research.

Y3



Learning Card Y3:
Researchers comply with their codes and regulations!
(ECoC 2017, p.6)
https://doi.org/10.5281/zenodo.3384733

This learning card introduces learners to guidelines of research integrity and requires criteria for the promotion of good research and the dialogue on it. In four learning steps, participants are asked to take account of the rules by which good research is maintained, switch to help mechanisms to ensure research integrity and establish an open, transparent, logical and reasonable dialogue. In rotatory role play, they recognise that structural violence hinders good research.

Figure 14: Y3 learning card

> "My course was already well familiar with the guidelines for good research practice that are relevant to them. There was great interest in focusing on specific points in the respective documents that concern their own research practice and raise questions in their current research process. I think we have already helped to promote a culture of research integrity by highlighting deficiencies in the regulations, which my participants experienced themselves.

Links from learning card Y3:

Seven Reasons to Care about Integrity in Research: https://www.scienceeurope.org/media/42sphgqt/20150617_seven-reasons_web2_final.pdf

Y4

Learning Card Y4:
Research groups work as transparently and openly as possible!
(cf. ECoC 2017, p.5)
https://doi.org/10.5281/zenodo.3384735

This learning card introduces learners to research collaborations and corresponding principles. In five learning steps, future researchers learn what collaborations are and why it's necessary to be able to reach an agreement. Participants relate to their own field of research, express their wishes and needs and practice mutual understanding and respect in a dialogue.

> "I started the exercise on interdisciplinary research collaboration by linking research agreements to open and transparent communication. My participants were really motivated. They came up with great research projects and dived deeply into their field of expertise.

Links from learning card Y4:

The European Code of Conduct for Research Integrity: https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf

If it works for your course, you can also use the following additional material:

The University of Sheffield provides information on acceptable practices in research collaborations and innovation https://www.sheffield.ac.uk/rs/

Figure 15: Y4 learning card

Y5

Learning Card Y5:
Researchers ensure appropriate authorship and citation!
(cf. ECoC 2017, p.7)
https://doi.org/10.5281/zenodo.3384737

This learning card covers the topic of scientific writing and authorship and introduces learners to the rules of research publication in five learning steps. In storytelling, participants explain guidelines of their own discipline and, for example, compare rules of correct authorship within various other disciplines. They accept different guidelines for publication and recognise the purpose of research publications.

> "With participants from a variety of disciplines, I was in a position to take myself back from advice as a lecturer. Participants themselves, of course, knew best the rules of publication in their discipline. It was exciting to discuss the various practices.

Links from the learning card Y5:

The European Code of Conduct for Research Integrity: https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf

If it works for your course, you can also use the following additional material:

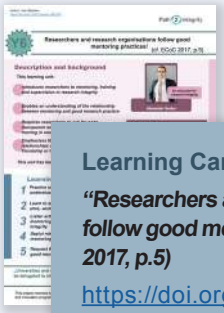
The Research Integrity Office (ORI) provides an infographic on "Authorship practices to avoid conflicts" providing suggestions that may help to avoid authorship disputes. https://ori.hhs.gov/sites/default/files/2018-09/Authorship%20Practices%20to%20Avoid%20Conflicts_Rasterized.pdf

The Research Integrity Office (ORI) provides a module on the prevention of plagiarism to help students, as well as professionals, identify and prevent questionable practices and to develop an awareness of ethical writing. https://ori.hhs.gov/sites/default/files/plagiarism.pdf

The document "Why do we even give sources?" presents a list of reasons why we give sources. The reasons can be collected by participants. https://www.academicintegrity.eu/wp/materials/why-do-we-even-give-sources-a-list-of-reasons-for-good-practice-maintaining-integrity/

Figure 16: Y5 learning card

Y6



Learning Card Y6:

"Researchers and research organisations follow good mentoring practices" (cf. ECoC 2017, p.5)

https://doi.org/10.5281/zenodo.3965703

This learning card introduces researchers to mentoring, training and supervision in research integrity and enables an understanding of the relationship between mentoring and good research practice. In five learning steps, researchers learn to ask for an open, transparent and trustworthy mentor-mentee relationship and depict differences between relationships of trust such as mentoring, friendship or therapy. They depict roles and responsibilities and develop a mentoring agreement of research integrity.

Links from the learning card Y8:

The European Code of Conduct for Research Integrity: https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf

5 Qualities of Good Research Mentors: https://ori.hhs.gov/sites/default/files/2018-09/5%20Qualities%20of%20Good%20Research%20Mentors.pdf

Figure 17: Y6 learning card

Y7

Learning Card Y7:

"Researchers withdraw from involvement when conflicts of interest arise"! (cf. ECoC 2017, p.6)

https://doi.org/10.5281/zenodo.3965716

This learning card addresses review and editing and stresses that researchers withdraw from involvement when conflicts of interest arise while emphasising the importance of transparency in research. In five learning steps, researchers learn how to properly manage conflicts of interest that can bias peer review and editing and practice understanding and being understood in a dialogue to reach an agreement.

> "The Y7 learning card on review and editing allowed my participants to use their expertise to support each other in open questions and problems they encounter and to strengthen their position as researchers.

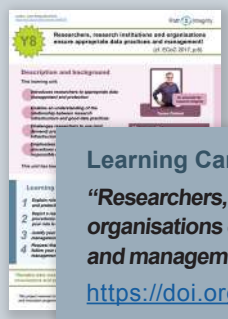
Links from the learning card Y7:

The European Code of Conduct for Research Integrity: https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf

COPE's ethical guidelines for peer reviewers: https://publicationethics.org/node/19886

Figure 18: Y7 learning card

Y8



Learning Card Y8:

"Researchers, research institutions and organisations ensure appropriate data practices and management"! (cf. ECoC 2017, p.6)

https://doi.org/10.5281/zenodo.3965729

This learning card introduces researchers to appropriate data management and protection and challenges them to use and demand proper institutional infrastructure on data practices. In five learning steps, storytellers justify their procedure of data management and protection. They reflect on appropriate data practices, use data management and protection guidelines and explain procedures and infrastructure in which their rule is embedded.

> "I did several P2I sessions, but this learning card really caught the eye of my audience. Participants had a lot of open questions about data storage that they needed to resolve in order to continue working on their research. I noticed that things started to get emotional and allowed for open discussion. It was great to help solving problems using the learning card!

Links from the learning card Y8:

If it works for your course, you can also use the following additional material:

The UK Data Service provides researchers from all sectors with information on their data needs, such as tips on data management and deposit. https://www.ukdataservice.ac.uk/

The Data Management Expert Guide helps social science researchers dealing with research data, from planning, organising and storing data, to protecting and publishing research data. https://www.cessda.eu/Training/Training-Resources/Library/Data-Management-Expert-Guide

Figure 19: Y8 learning card

M9

Learning Card M9:

Research integrity is a professional, ethical and legal responsibility! (cf. ECoC 2017, p.4)

https://doi.org/10.5281/zenodo.3384720

With this learning card, participants reflect on the professional, legal and ethical importance of research integrity in science and society. In four learning steps, they become aware of their own research integrity, outline values for their research and create their own declarations in favour of honest research. This learning card should be used to conclude your teachings with the Path2Integrity learning cards from the M-series. With the post-test and the request in learning card M9 to send an email to evaluation@path2integrity.uni-kiel.de, you will be able to gain insight into your students' improvement.

> "It was great to do the test again at the end of the course with four of the P2ILC and to hear from the students themselves that they felt much more confident in their answers on research integrity questions.

Links from learning card M9:

Evaluation of the learning units: https://path2integrity.eu/limesurvey/index.php/238122?newtest=Y&lang=en

If it works for your course, you can also use the following additional material:

"On being a scientist" is an approximately 60 minute long fictional film that takes up some important topics of questionable research practices. After you have given participants a deeper insight into the topic of research integrity, this film can be used to reflect once again on what has been learned. https://www.youtube.com/watch?v=tCgZSjoxF7c&feature=youtu.be

The article **"Understanding Reproducibility and Replicability"** discusses how the practice of science has evolved. After you have given participants a deeper insight into the topic of research integrity, you can reflect on reproducibility and replicability. https://

Figure 20: M9 learning card

References

Bouter, L. (2019). What is research integrity? Talk at Amsterdam Scholarly Summit, 2 July 2019, http://editorresources.taylorandfrancis.com/wp-content/uploads/2019/07/What-is-research-integrity-Transcript.pdf

Franck, O., Osbeck C. (2016). Challenging the concept of ethical literacy within Education for Sustainable Development (ESD): Storytelling as a method within sustainability didactics. In: Education 3–13, 46 (2): 133–142.

Fürstenau, B. (2015). Rollenspiel. In: Wiechmann J., Wildhirt S. (ed.), Zwölf Unterrichtsmethoden. Weinheim und Basel: Beltz, 95–110.

Gethmann C.F. (2005). Dialog, rationaler [rational dialogue]. In: Mittelstrass, J. (ed.), Enzyklopädie Philosophie und Wissenschaftstheorie, vol. 2. Stuttgart/Weimar: Metzler, 191.

Habermas, J. (1990). Discourse ethics: Notes on a program of philosophical justification. In: Moral consciousness and communicative action. Cambridge: MIT Press, 43–115.

Häberlein, L. (2020). Path2Integrity Target Groups. Deliverable D3.3 EU Horizon 2020 Path2Integrity Project, Grant agreement No 824488.

Janich, P. (2009). Kein neues Menschenbild. Zur Sprache der Hirnforschung [No new image of man. About a language of brain research]. Frankfurt am Main: Suhrkamp.

Kaiser, F.-J., Brettschneider, V. (2015). Fallstudie. In: Wiechmann J., Wildhirt S. (ed.), Zwölf Unterrichtsmethoden. Weinheim und Basel: Beltz, 146–160.

Klare, T., Krope, P. (1977). Verständigung über Alltagsnormen. Der rationale Dialog – das Verfahren einer undogmatischen Rechtfertigung von Verhaltensnormen. Ein Kursprogramm für den Sekundarstufenunterricht. München: Urban und Schwarzenberg.

Krope, P. (2013). Dialogische Migrationssozialberatung. Argumentative Wege zur Anerkennung des Anderen [Dialogical social migration counselling. Argument-based ways of recognizing the other]. Münster/New York/München/Berlin: Waxmann.

Lorenz, K. (2005). Dialog [Dialogue]. In: Mittelstrass, J. (ed.) Enzyklopädie Philosophie und Wissenschaftstheorie vol. 2. Stuttgart/Weimar: Metzler, 189–191.

Löfström, E. (2012). Students' Ethical Awareness and Conceptions of Research Ethics. In: Ethics & Behavior 22 (5): 349–361. https://doi.org/10.1080/10508422.2012.679136

Nimmerfroh, M. (2016). Flipped Classroom. Gütersloh: Bertelsmann Stiftung. https://www.die-bonn.de/wb/2016-flipped-classroom-01.pdf

Nussbaum, M.C. (1990). Love's knowledge: Essays on philosophy and literature. New York: Oxford University Press. http://search.ebscohost.com/login.asp?direct=true&scope=site&db=nlebk&db=nlab k&AN=367525

Nussbaum, M.C. (1997). Cultivating Humanity: A Classical Defense of Reform in Liberal Education (7th ed.) Cambridge, Mass.: Harvard University Press, 85 and 95.

Phillips, L. (2010). Social justice storytelling and young children's active citizenship. In: Discourse: Studies in the Cultural Politics of Education 31 (3): 363–376. https://doi.org/10.1080/01596301003786993

Prieß-Buchheit, J., Aro, A., Kuzmova, I., Lanzerath, D., Stoev, P., Wilder, P. (2020). Rotatory role-playing and role-models to enhance the research integrity culture. Research Ideas and Outcomes 6: e53921. https://doi.org/10.3897/rio.6.e53921

Retzmann, T. (2007). Die Dilemmamethode im Ökonomie-unterricht. In: Unterricht Wirtschaft 8 (30): 41–47.

Widdershoven, G., Solbakk, J. (2019). Dialogue versus Debate, Embassy of Good Science. https://www.embassy.science/theme/dialogue-versus-debate

Wilder, N., Zollitsch, L., Lindemann, T., Niesel, D., Vilter, N. Dwojak-Matras, A. (2020). Report on the efficiency assessment. Deliverable D6.1 EU Horizon 2020 Path2Integrity Project, Grant agreement No 824488.

Zipes, J. (2005). To Eat or Be Eaten: The Survival of Traditional Storytelling. In: Storytelling, Self, Society 2 (1): 1–20.

Code of Conduct

European Code of Conduct for Research Integrity (2017) Revised Edition. https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/h2020-ethics_code-of-conduct_en.pdf, May 5th 2020.

List of links

https://www.path2integrity.eu/ri-materials All Path2Integrity learning cards and accompanying material

https://doi.org/10.5281/zenodo.3383843 Learning Card M0

https://doi.org/10.5281/zenodo.3384727 Learning Card Y1

https://doi.org/10.5281/zenodo.3384731 Learning Card Y2

https://doi.org/10.5281/zenodo.3384733 Learning Card Y3

https://doi.org/10.5281/zenodo.3384735 Learning Card Y4

https://doi.org/10.5281/zenodo.3384737 Learning Card Y5

https://doi.org/10.5281/zenodo.3965703 Learning Card Y6

https://doi.org/10.5281/zenodo.3965716 Learning Card Y7

https://doi.org/10.5281/zenodo.3965729 Learning Card Y8

https://doi.org/10.5281/zenodo.3384720 Learning Card M9

https://www.path2integrity.eu/ Path2Integrity homepage

https://www.youtube.com/watch?v=ft-datvhmfo An introduction video for the use of the Path2Integrity Y-series learning cards

https://www.path2integrity.eu/teaching-RI The Path2Integrity roadmap, a categorised collection of existing innovative and traditional educational material on research integrity and research ethics

https://doi.org/10.5281/zenodo.3384746 Graphic: Hannah´s protocol - Is there a need for a research integrity policy?

https://path2integrity.eu/limesurvey/index.php/238122?newtest=Y&lang=en Pre-test to evaluate learning units

https://path2integrity.eu/limesurvey/index.php/238122?newtest=Y&lang=en Post-test to evaluate learning units

evaluation@path2integrity.uni-kiel.de email address of a P2I member to contact after evaluation

https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf The European Code of Conduct for Research Integrity

https://www.scienceeurope.org/media/42sphgqt/20150617_seven-reasons_web2_final.pdf Seven Reasons to Care about Research Integrity

https://ori.hhs.gov/sites/default/files/2018-09/5%20Qualities%20of%20Good%20Research%20Mentors.pdf 5 Qualities of Good Research Mentors

https://publicationethics.org/node/19886 COPE´s ethical guidelines for peer reviewers

Author: Julia Priess-Buchheit
https://doi.org/10.5281/zenodo.3383842

Path 2 Integrity

M0

Good research is based on honesty!
(cf. ECoC 2017, p. 4)

Description and background

This learning unit:

- *Introduces (future) researchers to the process of producing reliable research results*
- *Enables an understanding and usage of good research procedures*
- *Challenges (future) researchers to comply with research codes and principles*
- *Emphasises how important responsible conduct of research is for society*

An advocate for research integrity

Alexander Gerber

Keywords

Research practice; misconduct; honesty; reliability; accountability; respect in research; research and society

This unit has been prepared for all learning groups with a university degree.

Learning objectives

1. *Describe the values of a researcher*
2. *Outline reasons in favour of conducting reliable research*
3. *Argue in favour of the importance of reliable research results for both research and society*
4. *Realise consequences of research*

Learning stages

1. *Become familiar with the topic*
2. *Collect your experience*
3. *Dive into an interesting story*
4. *Connect to your own life*
5. *Engage in storytelling*
6. *Reflect on reasons for reliable research in society*

"We are responsible to cultivate society's trust with integrity to ensure the best research possible."
(Alexander Gerber, an advocate for research integrity)

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824488.

Author: Julia Priess-Buchheit
https://doi.org/10.5281/zenodo.3383842

1 Become familiar with the topic:

Homework (before the unit starts) or reading session

Fill out the survey to evaluate the learning units.
Use this link: https://path2integrity.eu/limesurvey/index.php/238122?newtest=Y&lang=en
A two-digit group code is required to link relevant data in an anonymised manner. Before you begin, define this code together with the group and use it in the questionnaire. Keep a note of the code for later use. Note any interesting or challenging cases as well as any unknown words and bring these notes to your class.

2 Collect your experience:

In your class, discuss how sure or unsure you were regarding your answers to the survey. Which cases from the survey were especially interesting to you?

3 Dive into an interesting story:

Read Hannah's story aloud. Describe her by embellishing the story. Who is she in your imagination? Is she, for example, a motivated master student in the field of humanities or rather a doctoral candidate in chemistry? Does she have many friends and prefers spending time out rather than studying?

4 Connect to your own life:

Take a minute for yourselves, and think about someone in your environment who used research results to argue in favour of something. Write down a description of that person and what they argued in favour of.

Research principles are...

"Reliability in ensuring the quality of research, reflected in the design, the methodology, the analysis and the use of resources.

Honesty in developing, undertaking, reviewing, reporting and communicating research in a transparent, fair, full and unbiased way.

Respect for colleagues, research participants, society, ecosystems, cultural heritage and the environment.

Accountability for the research from idea to publication, for its management and organisation, for training, supervision and mentoring, and for its wider impacts." (ECoC 2017, p. 4)

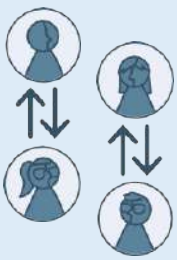
5 Engage in storytelling:

Introduce your character. In pairs, introduce your character vividly to your partner. What did the person argue in favour of, using their research results? Explain whether this person is a researcher or whether they are working in another area of society.

Imagine the worst. In a co-creative process with your partner, pick one of the people you wrote about and imagine a scenario in which the research results turn out to be fraudulent because the researcher cheated. Build a story around the cheating researcher and your character. Include a person or part of society that is hurt by the fraudulent results. Write your storyline down in bullet points.

Turn it to its best. Now rewrite your story! Together, imagine that another researcher steps in to stop the cheating. Describe this researcher's values, as well as how your character is now able to use reliable research results to make their argument. Write a short story in which a person or part of society benefits from the reliable results.

Read some of these stories aloud!



6 Reflect on reasons for reliable research in society:

As a class, brainstorm reasons for reliable research and write these on a chalk board or flip chart. Discuss why it is important that researchers follow good research practice!

Pick four significant reasons from the board as to why researchers need to follow these principles. Write them in your notebook.

Author: Lisa Häberlein
https://doi.org/10.5281/zenodo.33847276

Path 2 Integrity

Y1

The research environment constitutes itself through clear infrastructure, policies and procedures! (cf. ECoC 2017, p. 5)

Description and background

This learning unit:

- *Introduces researchers to the research environment*
- *Enables an understanding of the relationship between research environment and good research practices*
- *Challenges researchers to reflect on roles and responsibilities in the research environment*
- *Emphasises the importance of infrastructure, policies and procedures supporting responsible conduct of research*

An advocate for research integrity

Justyna Olko

Keywords

Research codes and regulations; good research practice; structural violence; respect; openness and transparency

This unit has been prepared for interdisciplinary learning groups.

Learning objectives

1. *Identify and actively use research infrastructure, policies and procedures*
2. *Depict roles and responsibilities on an individual, interpersonal and institutional level*
3. *Explain and justify important norms from your research environment*

Learning stages

1. *Become familiar with the topic*
2. *Dive into an interesting story*
3. *Do a classroom walkabout*
4. *Engage in storytelling*
5. *Reflect on the research environment*

"A university or research centre should offer freedom of research as a basic condition, which will have a positive effect on the quality, reliability and importance of the research carried out." (Justyna Olko, an advocate for research integrity)

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824488.

Author: Lisa Häberlein
https://doi.org/10.5281/zenodo.3384726

1 Become familiar with the topic:

Homework (before the unit starts) or reading session

Read the paragraph on research environment in “The European Code of Conduct for Research Integrity”.

Take a few minutes to think about your own research environment and try to relate to the research integrity issues mentioned in the paragraph. Is there a lack of clear infrastructure, policies or procedures in your discipline?

European Code of Conduct for Research Integrity:

2 Dive into an interesting story:

Read or recall Hannah’s protocol and briefly flesh out what happened in the conference.

The members of the conference represent various groups of interest. Among them are early-career researchers, faculty chairpersons, reviewers of journals, heads of research foundations, whistleblowers and others.

3 Do a class room walkabout:

Make further associations with the following five statements:

1. As a researcher, I can generate reliable research results by...
2. Our institution should foster a culture of research integrity by...
3. Scientific journals and reviewers should evaluate submissions by...
4. Funding agencies can help ensure excellence in research by...
5. To promote good research practice, whistleblowers should raise awareness of...

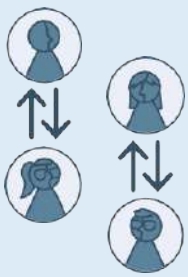
Write the statements on pieces of paper and distribute them on tables. Spread out in the room and do a classroom walkabout. Leave your comments on the statements given on the sheets.

4 Engage in storytelling:

Now place yourself in five groups and evaluate one of the posters each.

Summarise the statements and corresponding remarks by bringing them together in a story. Ascribe the statements and comments to Hannah and tell how she addresses the topic from your poster. Imagine that Hannah takes the floor in the conference meeting and states for example: “As a young researcher from the faculty of x, I generate reliable research results by…”. Include all comments and embellish the story with details.

Read your stories aloud!



5 Reflect on the research environment:

Put all the posters on the wall and meet in front of them as a class.

Review the comments and reflect on terms for each poster that are especially important to you. Agree on the three most important ones and write them in your notebook.

Which other individuals and institutions are responsible for maintaining research integrity in the research environment? What is their role and how can they contribute to achieve this goal? Together, collect more information and discuss.

Author: Julia Priess-Buchheit
https://doi.org/10.5281/zenodo.3384730

Path 2 Integrity

Y2

"Researchers design, carry out, analyse and document research in a careful and well-considered manner."
(ECoC 2017, p. 5)

Description and background

This learning unit:

- *Introduces researchers to (questionable) research procedures and reliable research results*
- *Builds the competency to discuss research procedures and research results*
- *Challenges researchers to explain and justify research procedures*

An advocate for research integrity

Philippe Grandjean

Keywords

Research procedures; responsible research conduct; questionable research practice; misconduct

This unit has been prepared for interdisciplinary learning groups.

Learning objectives

1. *Accept ambiguity: be open and unprejudiced*
2. *Explain and justify research procedures*
3. *Compare and prioritise different research procedures*
4. *Explain and justify your research procedures to other researchers*

Learning stages

1. *Become familiar with the topic*
2. *Connect to your own life*
3. *Engage in role play*
4. *Explain and justify research procedures*
5. *Evaluate different arguments, face dissent and achieve consensus*

"I go where evidence goes. Any pre-determined conclusion is against to what good research is about. It is against ethics."
(Philippe Grandjean, an advocate for research integrity)

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824488.

Author: Julia Priess-Buchheit
https://doi.org/10.5281/zenodo.3384730

1 Become familiar with the topic:

Homework (before the unit starts) or reading session

Read the paragraph on research procedures in "The European Code of Conduct for Research Integrity". Discuss the meanings of any unknown words.

Bring a short exposé of your research project with you.

European Code of Conduct for Research Integrity:

2 Connect to your own life:

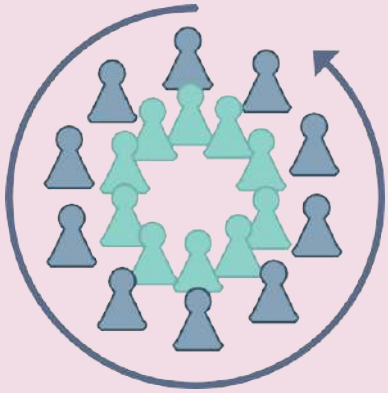
To prepare a short pitch about your research project, choose three of the following questions and connect them to your project by describing your (planned) research procedures.

1. How do you take into account the state-of-the-art and develop research ideas?
2. How do you conduct research in a careful and well-considered manner?
3. How do you use research funds in a proper and conscientious way?
4. How do you publish in an open, honest, transparent and accurate manner?
5. How do you manage data and safeguard confidential findings?
6. How do you report results in a way that is verifiable, reproducible and compatible with the standards of your discipline?

(cf. ECoC 2017, pp. 5–6)

Write yourself flashcards with bullet points for your 3-minute pitch.

3 Engage in role play:



Come together and greet each other. Prepare the room for an evaluation "speed dating" circle with as many chairs as people. Decide which side will stay seated and which will move on.

Take your seats! Those seated on the inner circle play experienced evaluators. Their task is to find out whether the research project being pitched to them is following good research practice. To do this, they should ask specific questions. Those seated on the outer circle pitch their research project and then try to answer the evaluation questions as clearly as possible.

Start the evaluation circle and change seats after 7 minutes. Repeat twice. Always thank the evaluator for the interview and say goodbye when you move on.

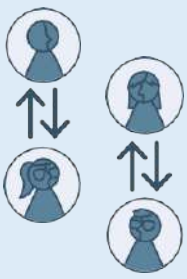
Change roles: Now those seated on the inside of the circle will pitch their research project and the others will ask precise questions to check whether the research project is following good research practice. Start the second evaluation circle and change seats every 7 minutes. Repeat twice.

Take a short break

4 Explain and justify research procedures:

On your own, consider what the evaluation speed dating introduced. Choose one of the six questions on research procedures from above for which the speed dating raised uncertainty for your research project. Take your time.

Explain and justify the corresponding research procedure you employ in your research project. Write your explanation and justification on a piece of paper. If possible, refer to codes or regulations. Entitle your text by quoting the question you are referencing.



5 Evaluate different arguments, face dissent and achieve consensus:

As a class, stand up and spread around the room. Try to explain and justify your research procedure to as many former evaluators as possible! If you are approached as an evaluator, give feedback. You can use words like "responsible research conduct", "questionable research practice" and "misconduct". Always express your appreciation for the interview before you pass on to another person. If necessary, think about adjusting your research procedure.

Come together as a class and discuss the terms "responsible research conduct", "questionable research practice" and "misconduct".

Author: Julia Priess-Buchheit
https://doi.org/10.5281/zenodo.3384732

Path 2 Integrity

Y3

"Researchers comply with codes and regulations relevant to their discipline." (ECoC 2017, p. 6)

Description and background

This learning unit:

- *Introduces researchers to codes and regulations in their discipline*
- *Enables an understanding of compliance and of potential complications*
- *Challenges researchers to demand compliance in research*
- *Emphasises how to switch to help mechanisms when an open and transparent dialogue about rules is not possible*

An advocate for research integrity

Kristina Bliznakova

Keywords

Research codes and regulations; openness and transparency; ombudsperson; safeguards; impartiality, objectivity, confidentiality

This unit has been prepared for interdisciplinary learning groups.

Learning objectives

1. *Refer to codes and regulations*
2. *Discuss the rules of your discipline in an open and transparent manner*
3. *Realise conditions for a research integrity dialogue*

Learning stages

1. *Become familiar with the topic*
2. *Immerse yourself in rules relevant to your discipline*
3. *Engage in role play*
4. *Reflect*

"As a scientist, it is important to follow the principles of research integrity because with their help, cooperation with partners can be improved." (Kristina Bliznakova, an advocate for research integrity)

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824488.

Y3 Path 2 Integrity

Author: Julia Priess-Buchheit
https://doi.org/10.5281/zenodo.3384732

1 Become familiar with the topic:

Homework (before the unit starts) or reading session

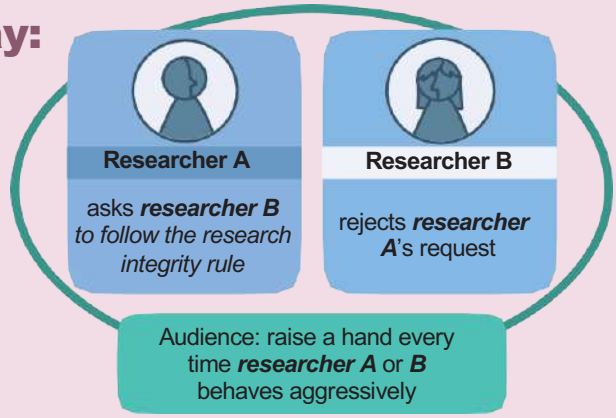
Find what you view to be the most important code of research conduct within your discipline. Read it and bring it with you. Find a case of misconduct that happened in your discipline and bring a short description of it with you.

2 Immerse yourself in rules relevant to your discipline:

Read or recall Hannah's protocol and briefly flesh out what happened in the conference meeting. In pairs, take out the research rule that you chose from your code of research conduct. Imagine that your partner is Hannah. Explain the rule that you have chosen, and why it is the most important research integrity rule within your discipline.
Switch roles!

3 Engage in role play:

Come together in a plenum, greet everyone and introduce yourself. Pick two volunteers to engage in an improvised rotatory role play in which researcher A uses their important research integrity rule.



Every time someone from the audience raises a hand, the actor should stop and ask the audience for a rational argument for why they should follow the research integrity rule. The actor should then continue the play using the argument from the audience. If two others are voluntarily up for this task, play again!

Research integrity office

Research integrity offices handle allegations of misconduct by obtaining expert opinions, statements and hearings. They are an impartial and confidential body to evaluate responsible conduct of research in a professional manner.

Divide your class into five groups. Assign each group a position in the play.

Person Z's group decides which misconduct case will be discussed in the upcoming role play and outlines the case in bullet points on the chalk board or flip-chart. Each group should take 15 minutes to prepare its role and to decide who will act in the play. Send your actor into the play with the bullet points or a written text!

Individual or institution
played by one person

presents a short, detailed case of Person Z's research misconduct

Person Z
played by one person

makes a statement defending their action to ignore the rules of research integrity

Research integrity safeguard

represented by three independent experts from different disciplines (if possible, ***ombudsperson 1*** should be in the same discipline as ***person Z*** and ***ombudsperson 2*** should be in an affiliated discipline. ***Ombudsperson 3*** may be from another discipline).

Ombudsperson 1
makes a statement about why this case is a misconduct case; refers to rules, regulations and codes of conduct.*

Ombudsperson 2
makes a statement about the severity of the case

Ombudsperson 3
makes a statement about the importance of research integrity;

outlines possible impacts of the case.

** If this statement receives no approval from the audience, discuss in the plenum why objectivity is difficult in this case and then move on to the next case.*

4 Reflect:

Come together as a class.

Discuss when to reach out for help from people and entities in charge of enforcing research integrity such as data management officers, ombudspersons and/or ethics committees. Together come up with three rules on when it is time to seek help!

Write the rules into your notebook.

Seven Reasons to Care about Integrity in Research

A policy paper by Science Europe lists the following key reasons for integrity in research:

1 Research integrity safeguards the foundations of science and scholarship
2 Research integrity maintains public confidence in researchers and research evidence
3 Research integrity underpins continued public investment in research
4 Research integrity protects the reputation and careers of researchers
5 Research integrity prevents adverse impact on patients and the public
6 Research integrity promotes economic advancement
7 Research integrity prevents avoidable waste of resources

(cf. Science Europe Working Group on Research Integrity – Task Group 'Knowledge Growth' 2015, Seven Reasons to Care about Integrity in Research)

Author: Julia Priess-Buchheit
https://doi.org/10.5281/zenodo.3384734

Path 2 Integrity

Y4

Research groups work as transparently and openly as possible!

(cf. ECoC 2017, p. 5)

Description and background

This learning unit:

- *Introduces researchers to norms in research collaborations*
- *Builds competency to set common objectives and norms in research collaborations*
- *Challenges researchers to choose norms on which their partners in a research collaboration agree*
- *Emphasises openness and transparency and its limits*

An advocate for research integrity

Kristina Bliznakova

Keywords

Collaborative working; openness and transparency; common objectives; agreement; roles and responsibilities

This unit has been prepared for interdisciplinary learning groups.

Learning objectives

1. *Listen actively and present your own wishes, aims and goals*
2. *Accept and learn to respect others' wishes, aims and goals*
3. *Practice being able to understand others and be understood by them in dialogues*
4. *Learn to formulate an agreement with logically traceable arguments*

Learning stages

1. *Become familiar with the topic*
2. *Dive into an interesting story*
3. *Discuss and come to an agreement*
4. *Reflect on collaborative research*

"Research collaborations open doors for joint scientific activities that can provide amazing results that benefit our society."

(Kristina Bliznakova, an advocate for research integrity)

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824488.

Author: Julia Priess-Buchheit
https://doi.org/10.5281/zenodo.3384734

1 Become familiar with the topic:

Homework (before the unit starts) or reading session

Read the paragraph on good research practice in "The European Code of Conduct for Research Integrity". Discuss the meanings of any unknown words.

Ask around whether it is possible to read an agreement of collaborative work from your institution. If you are able to, read one!

European Code of Conduct for Research Integrity:

2 Dive into an interesting story:

Read or recall Hannah's protocol and flesh out her character in six adjectives.

Imagine that Hannah receives an answer from her friend Rory the next morning. Read the message aloud in class:

Dear Hannah,

thank you for stepping in for me at the conference meeting. You really saved the day. It seems you encountered one of the more interesting meetings :) In my experience, a research integrity policy would be desirable.

Did I already tell you that one partner (we can call him 07) from our international collaboration asked me to store his data recently? At first I was surprised about the odd request – 07 just asked us bluntly via email to store the data. After a few emails back and forth I found out that his (very prestigious) institution had restrictive data protection rules and 07 was trying to bypass them by using us. After thinking about it for a while I refused to store the data. Even if it's not legally forbidden, I assume that these data are ethically questionable. Seriously, 07's last email ended with this: YOUR INSTITUTION DOESN'T HAVE A CODE OF CONDUCT! IF YOU DO NOT STORE THE DATA WE WILL NO LONGER CONSIDER YOU A PARTNER IN THIS COLLABORATION.... see what I mean about needing a research integrity policy?

:) I just realised I'll be in your neighbourhood on Wednesday evening. Do you have time for a drink? I can tell you the rest of 07's story... but only if you want! Promise!!

Best,

R

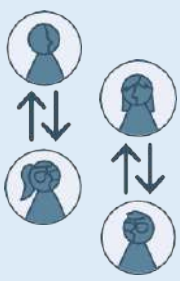
3 Discuss and come to an agreement:

Come together in groups of three to four people. Make sure that you have different disciplinary backgrounds. Imagine you start a collaboration. Give your collaboration a meaningful title, and think about what each of you can contribute to this collaboration.

One partner asks you to agree on complete transparency and openness in your collaboration from start to finish. Discuss what that means and indicate any limits this request. Give reasons for these possible limitations. Together, write a paragraph on transparency and openness for your collaboration agreement that everyone approves of.

Take one rule/norm from your agreement paragraph and discuss how each of your actions would look if you adhered to this rule.

Read some of the agreement paragraphs aloud!



4 Reflect on collaborative research:

Come together as a class and discuss the following questions:

- When should researchers insist on a written agreement?
- What fields (roles and responsibilities, interests, compliance, training and supervision etc.) should an agreement cover at a minimum?

Author: Julia Priess-Buchheit
https://doi.org/10.5281/zenodo.3384736

Path 2 Integrity

Y5

Researchers ensure appropriate authorship and citation!

(cf. ECoC 2017, p. 7)

Description and background

This learning unit:

- *Introduces researchers to rules of publication*
- *Enables an understanding of authorship*
- *Challenges researchers to learn how rules of publication can differ between disciplines*
- *Emphasises the importance of proper publication in research*

An advocate for research integrity

Tomasz Sulej

Keywords

Academic writing; author sequence; self-plagiarism; publication rules; misconduct in publication; authorship; citation

This unit has been prepared for interdisciplinary learning groups.

Learning objectives

1. *Explain the rule of author sequences from your discipline*
2. *Compare discipline-specific rules of author sequence*
3. *Accept different publication rules*
4. *Understand the purpose of publication in research*

Learning stages

1. *Become familiar with the topic*
2. *Dive into an interesting story*
3. *Discuss different author sequence rules*
4. *Engage in storytelling*
5. *Reflect on the purpose of publication*

"Reliability of research also means that everyone who has made a contribution to this research must be mentioned." (Tomasz Sulej, an advocate for research integrity)

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824488.

Author: Julia Priess-Buchheit
https://doi.org/10.5281/zenodo.3384736

1 Become familiar with the topic:

Homework (before the unit starts) or reading session

Read the paragraph on publication and dissemination in "The European Code of Conduct for Research Integrity". Discuss the meanings of any unknown words.

European Code of Conduct for Research Integrity:

2 Dive into an interesting story:

Read or recall Hannah's protocol and briefly flesh out what happened in the meeting. Now imagine the following:

Hannah sits calmly in her chair, reading a research paper that was published two months ago. In it, the authors explain "interdisciplinarity" comprehensively. The paper shows how different researchers define this field. By incorporating the latest findings from an Australian researcher, this paper has opened up a new way of thinking and has already attracted some remarkable attention.

These combined findings will set the groundwork for completely new insights, Hannah muses. Her finger brushes the list of authors at the top of the paper. These names represent a new start in the era of interdisciplinarity. All four of them contributed something important to this new way of thinking.

3 Discuss different author sequence rules:

Form groups of three to four students from different disciplines. Explain to the rest of the group what kind of rules on author sequence exist in your discipline. Take turns! Discuss the different forms.

4 Engage in storytelling:

Imagine you are a group of researchers in an interdisciplinary project. You just got cutting edge results from your first three work packages. You are celebrating and decide to communicate these findings and publish your work.

Please write a short story starting with this sentence:

"Even from far way, everyone could see that the group was a motley bunch of researchers celebrating something."

Include three of the following topics in your story:

- *Responsibility for the content*
- *Sequence of authorship*
- *Disclosure of conflicts of interest*
- *Significant contribution*
- *Acknowledgement of the important work and intellectual contributions of others*
- *Timely, open, transparent and accurate communication*
- *Consideration and validation of negative or non-significant results*

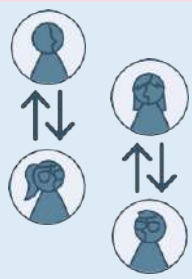
Misconduct in publication can appear in the following forms:

- "Manipulating authorship or denigrating the role of other researchers in publications.
- Re-publishing substantive parts of one's own earlier publications, including translations, without duly acknowledging or citing the original ('self-plagiarism').
- Citing selectively to enhance own findings or to please editors, reviewers or colleagues.
- Withholding research results.
- Allowing funders/sponsors to jeopardise independence in the research process or reporting of results so as to introduce or promulgate bias.
- Expanding unnecessarily the bibliography of a study."

(ECoC 2017, p. 8)

Read your stories aloud!

Discuss some of the publication rules from your disciplines. Are you unsure about some of the rules? Clarify in class how to proceed with publication.



5 Reflect on the purpose of publication:

Discuss the following questions together as a class, and copy bullet point answers into your notebook:

- What were the three most important publication rules discussed during this session?
- Why does publication in research matter?
- Why do we need rules in research publication?

Author: Lisa Häberlein
https://doi.org/10.5281/zenodo.3965702

Path 2 Integrity

Y6

Researchers and research organisations follow good mentoring practices!

(cf. ECoC 2017, p. 5)

Description and background

This learning unit:

- *Introduces researchers to mentoring, training and supervision in research integrity*
- *Enables an understanding of the relationship between mentoring and good research practice*
- *Requires researchers to ask for open, transparent and trustworthy mentoring and training in research integrity*
- *Emphasises the difference between relationships of trust such as mentoring, friendship or therapy*

An advocate for research integrity

Alexander Gerber

Keywords

Mentoring; training and supervision; mentor–mentee relationship; agreement; openness; trust

This unit has been prepared for interdisciplinary learning groups.

Learning objectives

1. *Practice understanding and being understood in a dialogue*
2. *Learn to accept and respect the aims, wishes and goals of others*
3. *Listen actively and develop a mentoring agreement of research integrity*
4. *Depict roles and responsibilities in mentoring relationships*
5. *Request that researchers follow good mentoring practices*

Learning stages

1. *Become familiar with the topic*
2. *Dive into an interesting story*
3. *Come to an agreement*
4. *Find criteria for a mentor–mentee relationship*
5. *Reflect on mentoring in research integrity*

"Universities and research centres could reflect harder whether research integrity can merely be delegated to ethical review boards and PhD trainings."

(Alexander Gerber, an advocate for research integrity)

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824488.

Author: Lisa Häberlein
https://doi.org/10.5281/zenodo.3965702

1 Become familiar with the topic:

Homework (before the unit starts) or reading session

Read the paragraph on training, supervision and mentoring in "The European Code of Conduct for Research Integrity".

Find out if there is an opportunity for mentoring at your institution. What does the programme offer?

European Code of Conduct for Research Integrity

2 Dive into an interesting story:

Read or recall Hannah's protocol. Now imagine the story continues as follows:

Hannah decides to enrol in a mentoring programme in research integrity at her institution. She hopes to find a mentor and source of inspiration that will help her to clarify some of her questions concerning her future career. "This will help me to move forward", she thinks.

In pairs, think about what Hannah's mentor should be like. On the other hand, what is Hannah's role as a mentee? Discuss and take notes.

5 QUALITIES OF GOOD RESEARCH MENTORS:

3 Come to an agreement:

Put all the tables and chairs aside and spread out in the room. Play a dialogue between mentor and mentee at their first meeting, defining their expectations and goals as well as clarifying general conditions. Exchange information about the further organisation and intended procedure of your mentoring, the content of the upcoming meetings, the basis of a relationship of trust and how to deal with possible conflicts.

Summarise your results in a jointly prepared mentoring agreement.

Read some of your agreements aloud!

4 Find criteria for a mentor–mentee relationship:

Come together in class and collect your notes on a chalkboard or flipchart.
As a class, agree on the three most important points and write them into your notebook.
To do so, complete the following sentences:

A mentor for research integrity should_____.

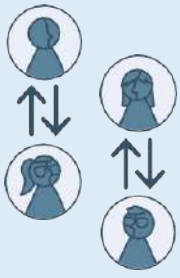
A mentor for research integrity should_____.

A mentor for research integrity should_____.

A mentee should_____.

A mentee should_____.

A mentee should_____.



5 Reflect on mentoring in research integrity:

Discuss the following questions in class:

- Which mentoring relationships do you know?
- Which issues do not belong in a mentoring relationship?
  What is the difference between mentoring, friendship and therapy?

Tips for building a mentor–mentee relationship:

- Show openness and interest.
- Establish a relationship of trust.
- Reflect expectations and goals.
- Set concrete and realistic objectives.
- Discuss specific questions and concerns.

Authors: Tom Lindemann and Lisa Häberlein
https://doi.org/10.5281/zenodo.3965715

Path 2 Integrity

Y7

Researchers withdraw from involvement when conflicts of interest arise!

(cf. ECoC 2017, p. 7)

Description and background

This learning unit:

- *Introduces researchers to review and editing*
- *Enables an understanding of conflict of interest in review and editing*
- *Challenges researchers to learn how to properly manage conflicts of interest*
- *Emphasises the importance of transparency in research*

An advocate for research integrity

Albrecht Beutelspacher

Keywords

Reviewing; editing; evaluation; conflict of interest; peer review; publishing; transparency

This unit has been prepared for interdisciplinary learning groups.

Learning objectives

1. *Explain how conflicts of interest can bias peer review and editing*
2. *Practice understanding and being understood in a dialogue*
3. *Evaluate different mechanisms to manage conflicts of interest*
4. *Listen actively and suggest how conflicts of interest may be settled*
5. *Learn to respect and accept the aims and wishes of others*

Learning stages

1. *Become familiar with the topic*
2. *Dive into an interesting story*
3. *Discuss different forms of peer review*
4. *Come to an agreement*
5. *Evaluate options to resolve conflicts of interest*

"Our goal should not be to simply publish as many papers as possible. We need experts in the field, who take a close look at the publication and evaluate it."
(Albrecht Beutelspacher, an advocate for research integrity)

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824488.

Authors: Tom Lindemann and Lisa Häberlein
https://doi.org/10.5281/zenodo.3965715

1 Become familiar with the topic:

Homework (before the unit starts) or reading session

Read the paragraph on reviewing, evaluating and editing in "The European Code of Conduct for Research Integrity" and the "COPE Ethical Guidelines for Peer Reviewers".

Discuss the meanings of any unknown words.

In your own words, what are the responsibilities of peer reviewers?

European Code of Conduct for Research Integrity:

COPE Ethical Guidelines for Peer Reviewers:

2 Dive into an interesting story:

Read or recall Hannah's protocol and briefly flesh out what happened in the meeting. Now imagine the following:

Some weeks after the meeting Hannah meets a colleague who complains that an article he had submitted the year before to a leading journal in his field was rejected, whereas a similar article reaching the same conclusions was published in the latest issue. The first author of the published article states in the CV on her website that she is a reviewer for the journal.

Although the review process was anonymous, he suspects that the first author of the published paper reviewed his manuscript and recommended its rejection, not on grounds of quality, but because she wanted to publish a similar paper that otherwise would have lacked originality. Hannah's colleague is enraged and feels betrayed by the peer review system.

3 Discuss different forms of peer review:

Form groups of three to four students from different disciplines. Discuss in the group what forms of peer review you are familiar with and which forms of peer review are most common in your discipline.

How do you define, for example, a review process that is known as

- single-blind,
- double-blind,
- collaborative,
- open or
- post-publication?

Conflicts of interest can have different causes:

Financial conflicts of interest
- Direct payment from sponsor of study
- Holding stocks in sponsoring company
- Receiving financial remuneration for services
- Other financial relationships with the producer of the investigational product

Non-financial conflicts of interest
- Personal conflicts of interest
- Intellectual conflicts of interest
- Medical conflicts of interest

(ENERI Classroom, Overlapping issues: Conflict of interest)

4 Come to an agreement:

Imagine Hannah's colleague approaches you and asks whether you think he should raise his suspicion with the journal editors. What would you recommend him to do?

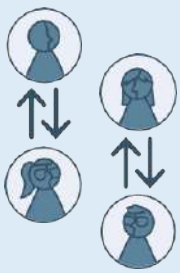
Create a mind map together as a group and share your recommendations. Draw a creative landscape with keywords, thoughts, sketches or symbols on a piece of paper.

Discuss your ideas in the group and agree on the three most important recommendations.

Write them on a piece of paper and pass them on to another group so that they can supplement your recommendations with their own.

Put one of the collections on the wall and meet in front of it as a class.

Read your recommendations aloud!



5 Evaluate options to resolve conflicts of interest:

Discuss the following questions together as a class, and copy bullet point answers into your notebook:

- What consequences do your recommendations have?
- What safeguards against conflicts of interest are you aware of? Do you consider them sufficient and effective? If yes, why? If no, why not?
- Who should be responsible for managing, avoiding and resolving conflicts of interest in the review process?

Author: Julia Priess-Buchheit
https://doi.org/10.5281/zenodo.3965728

Path 2 Integrity

Y8

Researchers, research institutions and organisations ensure appropriate data practices and management!

(cf. ECoC 2017, p. 6)

Description and background

This learning unit:

- ***Introduces researchers to appropriate data management and protection***
- ***Enables an understanding of the relationship between research infrastructure and good data practices***
- ***Challenges researchers to use (and demand) proper institutional infrastructure on data practices***
- ***Emphasises the importance of policies procedures and infrastructure supporting responsible data management and protection***

An advocate for research integrity

Tymon Zieliński

Keywords

Institutional infrastructure; policies and procedures; data management; data protection; responsible conduct of research

This unit has been prepared for interdisciplinary learning groups.

Learning objectives

1. ***Explain rules of data management and protection in research***
2. ***Depict a research code and explain procedures and infrastructure in which your rule is embedded***
3. ***Justify your procedure of data management and protection***
4. ***Request that other disciplines follow your procedure of data management and protection***

Learning stages

1. ***Become familiar with the topic***
2. ***Dive into an interesting story***
3. ***Use data management and protection guidelines***
4. ***Engage in storytelling***
5. ***Reflect on appropriate data practices and management***

"Reliable data must first be collected, then processed accurately in order to draw reliable conclusions and present them fairly."
(Tymon Zieliński, an advocate for research integrity)

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824488.

Author: Julia Priess-Buchheit
https://doi.org/10.5281/zenodo.3965728

1 Become familiar with the topic:

Homework (before the unit starts) or reading session

Find and read a guideline or policy from your institution, discipline or country regarding data management and protection in research and in research institutions. Think about a data management or protection issue you encountered recently and how you solved it. Find a corresponding rule in the guideline or policy for your solution. Discuss the meanings of any unknown words.

2 Dive into an interesting story:

Read or recall Hannah's protocol and briefly flesh out what happened in the conference meeting. Now read the following short story out loud. Use your imagination and describe the situation that Hannah is in.

Again Hannah just wanted to disappear. "Data protection. Are you serious?", asked her colleague. "Nowadays everyone's saying data protection this, data protection that....but nobody really knows what needs to be done! Do you?" Her colleague's eyes looked directly into hers as she spoke. "What now?", Hannah thought, exhaling. She knew a bit about data protection, but not enough to explain which procedure was appropriate.

3 Use data management and protection guidelines:

Get into groups of three or four from different disciplines. Share within your group...

- to which what data management or protection questions you have been able to find an answer recently,
- which data management and protection guidelines you have found and
- which procedure you used to manage and protect data.

Make sure you understand each other by asking back. Take turns!

4 Engage in storytelling:

Write speeches in which you create heroes.
Let your heroes explain your data management or protection issue, outline the appropriate guideline and highlight procedures on how to manage and protect the data.

Outline the data management or protection rule of your chosen story by writing it on a chalk board or flip chart.

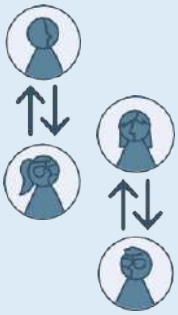
Together, make any final changes to your chosen story, and describe the infrastructure in it as clearly as possible:

1. Explain which issue of data management or protection is being addressed.
2. Depict which research code or policy guides this issue.
3. Describe which procedure helps you to manage and protect data.
4. Justify this data management and protection procedure.
5. Let your story end with requesting the audience to follow this procedure of data management and protection.

Read the stories aloud!

Data protection

Data protection is a broad field. Secondary data, big data, photographs, audio and video recordings or stakeholder data play an important role in research. Data protection includes procedures such as handling data storage in a secure way e.g. via cloud storage, transferral of data, use of informed consent forms or notice forms, depersonalisation of data etc.



5 Reflect on appropriate data practices and management:

Discuss the following questions in class:

Which of your colleagues' rules, procedure or infrastructure will you use in future to manage and protect data?

Are there any data management or protection issues you cannot solve due to the absence of clear institutional infrastructure? What infrastructure do you need to be able to solve it?

Review which data management and protection rules, procedures and infrastructure were discussed in this session that supported responsible conduct of research.

Author: Julia Priess-Buchheit
https://doi.org/10.5281/zenodo.3384719

Path 2 Integrity

M9

Research integrity is a professional, ethical and legal responsibility!

(cf. ECoC 2017, p. 3)

Description and background

This learning unit:

- ***Gives (future) researchers time to reflect on personal values***
- ***Challenges (future) researchers to confirm the importance of professionalism***
- ***Emphasises self-awareness as an important cornerstone for researchers***

For insight into the learning progress after Path2Integrity sessions, please send an email with your two-letter group code to evaluation@path2integrity.uni-kiel.de.

An advocate for research integrity

Anna Wójcicka

Keywords

Self-awareness; professionalism; ethical and legal responsibility; research values

This unit has been prepared for all learning groups with a university degree.

Learning objectives

1. ***Raise self-awareness about your own research integrity***
2. ***Outline professional values for your own research***
3. ***Make a research pledge to follow research principles together with the dialogue group***

Learning stages

1. ***Reflect on research integrity cases***
2. ***Connect to your own research***
3. ***Reflect on research integrity***
4. ***Phrase a research pledge***

"Just as we, as researchers, introduce people to the world, they will see this world through our eyes. And it is crucial that we base everything we present on solid evidence that we gather in the course of our scientific work." (Anna Wójcicka, an advocate for research integrity)

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824488.

Author: Julia Priess-Buchheit
https://doi.org/10.5281/zenodo.3384719

1 Reflect on research integrity cases:

Homework (before the unit starts) or reading session

Together with the rest of your class, go online and answer the questionnaire with everyone starting at the same time:
https://path2integrity.eu/limesurvey/index.php/238122?newtest=Y&lang=en
Your two-digit group code is required to link relevant data in an anonymised manner. Before you begin, repeat the group code you created earlier and use it in the questionnaire. How sure or unsure were you in answering this time? Discuss any interesting cases in class.

2 Connect to your own research:

Use post-its or similar and write down research integrity issues you have already experienced or issues you will likely face in future. Use one post-it per research integrity issue.
Stick the post-its on a wall in your classroom, putting similar issues one beside the other. You can use the eight categories from the ECoC to help organise them. Together, review whether your issues are research integrity issues or something else. Take down all the post-its not related to research integrity, as well as the ones you are not sure about.

Research integrity categories

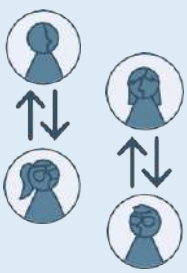
Researchers with research integrity produce reliable research results and are able to comprehensively convey how their research network is interlinked, by referring to the standards of their research discipline.
The ECoC's categories describe the many faces of research integrity (cf. ECoC 2017, pp. 5–7):

1. Research environment
2. Training, supervision and mentoring
3. Research procedures
4. Safeguards
5. Data practices and management
6. Collaborative work
7. Publication and dissemination
8. Reviewing, evaluating and editing.

3 Reflect on research integrity:

Go through your class' research integrity issues. Read them and consider what values somebody might need in order to overcome these issues. Write these down and compare them with your own values. Which of these values do you also have? Write the values that match on post-its and stick them on the wall.

Everybody picks somebody's value from the wall. Describe this value to your class by giving an example of various actions conducted by a researcher who embodies this value. Let the individuals who wrote down the values add any examples of researchers' actions, if they want.



4 Phrase a research pledge:

Stick the values back up on the wall in a row. Consider how you can express a promise to follow these values in one statement.

Be creative. Rearrange the post-its and try to create a statement. Rearrange them and try again... Put together multiple possible statements. Which one do you prefer and why?

Decide together which statement you would choose as researchers and then copy it in your notebook. Using your statement, make your Path2Integrity research pledge to follow research principles!