

Path Integrity

Path2Integrity Handbooks of Instructions: The P2ILC Programme

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Path2Integrity

**Rotatory role-playing and role-models
to enhance the research integrity culture**



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Subject to change

List of abbreviations

EU	European Union
P2I	Path2Integrity
P2IL	Path2Integrity Learning Card Programme
RI	Research integrity
WP	Work package

Preface

The Path2Integrity (P2I) project realizes a two-component approach to enhance the culture of research integrity. By developing and supporting innovative learning methods for different target groups, as well as evaluating their effectiveness, Path2Integrity achieves practical educational knowledge. P2I's campaign raises awareness on research integrity within educational organizations, while the P2I learning materials increase learners' ability "to reason on the acceptance or rejection of norms in research integrity" (Priess-Buchheit 2020). The consortium trains around 150 disseminators in its countries and beyond. It is running the campaign (videos, fact sheets, posters, brochures) in at least 15 European countries to foster a culture of research integrity.

Summary

P2I started to develop its learning programme in January 2019. This report describes the programme's development, purpose, content, and sustainability. The programme is called Path2Integrity Learning Card Programme (P2ILC) and contains three series. They aim to guide easy and fun learning sessions that support a culture of research integrity. Trainers can use all three series (see Appendix 1) for courses in secondary schools, universities, or within formal learning settings in adjunct areas. The P2ILC programme concentrates on collaborative learning techniques such as role-play, storytelling and coming to an agreement.

By translating the materials into different European languages, transferring them to online learning environments, and using a digital review section, Path2Integrity is making its P2ILC programme sustainable. The P2ILC programme is available both in printed folders and for download (<https://www.path2integrity.eu/ri-materials>) as well as in the online learning environment mentioned above (www.learning-p2i.eu).

1 What is the purpose of the Path2Integrity Learning Card Programme?

Path2Integrity (P2I) designed handbooks of instructions that help make the easy, fun learning sessions — which support a culture of research integrity — accessible and usable. These handbooks of instructions are referred to as Path2Integrity learning cards (P2ILC) from here onward. The P2ILCs are both freely accessible and usable in different fields of study. By analysing and improving successful learning pathways, P2I developed innovative sessions for learning research integrity.

P2I designed learning cards for three different target groups:

- early career researchers and professionals,
- graduates, and
- undergraduates and secondary school students (older than 16).

The bundle of different learning cards for each target group is called a P2ILC series. All three series concentrate on research integrity, are student-centred, refer to the European Code of Conduct as a reference document, and take different learning stages (Häberlein 2020) and various subfields (see figure 1) into account.

The first P2ILC series is called the Y-series and contains material and guidance for trainers teaching early career researchers and professionals. With the Y-series, trainers can teach learners “to clarify their own role in research, as well as help them understand how important reliable research is for society” (Priess-Buchheit & Häberlein in press c). This series includes one handbook and ten learning cards covering the subfields a) research environment; b) research procedures; c) safeguards in research; d) collaborative work in research; e) citation and publication in research; f) mentoring; g) publishing and conflict of interest; and h) data practices.



Figure 1: Topics in the P2ILC programme

The second series is called the M-series and contains materials and guidance for trainers teaching graduate students or alike. With the M-series, trainers can teach learners “to integrate their knowledge into their own research activities, as well as help them understand how important reliable research is for society” (Priess-Buchheit & Häberlein in press b). The M-series includes one handbook and eight learning sessions covering the subfields a) research environment; b) research procedures; c) safeguards in research; d) collaborative work in research; e) citation and publication in research; and f) data practices.

The third series is called the S-series and contains material and guidance for trainers teaching undergraduates and secondary school students older than 16. With the S-series, trainers can teach learners “to do research, as well as help them understand how important reliable research is for society” (Priess-Buchheit & Häberlein in press a). The S-series includes one handbook and eleven learning sessions covering the subfields a) the importance of reliable research results and research integrity; b) society needs responsible research, c) research environment; d) bad research can harm people, e) research procedures; f) safeguards in research; g) collaborative work between students; h) collaborative work in research; i) reliable information and fake news; j) citation and publication in research; and k) reliable research results and me.

Trainers can use the complete P2ILC programme (all three series, see Appendix 1 as well as Priess-Buchheit in press) for teaching in formal settings such as courses in secondary schools, universities, or in formal learning settings in adjunct areas. The P2ILC programme guides trainers to teach collaborative learning techniques such as role-play, storytelling and coming to an agreement, in order to enable learning sessions in which learners actively engage in dialogue. In all P2I learning sessions, learners “conduct dialogues on the acceptance or rejection of norms in research integrity” (Priess-Buchheit et al. 2020).

The table below displays the different target groups and the associated series of the P2ILC programme.

Direct Target Group	for trainers who teach groups of between 4–35 learners (recommended age of participants 16–99) onsite		
Indirect Target Group	for learners who no identity in their field of study yet	for learners who (are beginning to) have an identity in their field of study	for learners who (are beginning to) have an identity in their field of study
Group Composition	free	from one field of study	from different fields of study
Code	S-series	M-series	Y-series

Table 1: P2ILC's various target groups

2 How did Path2Integrity develop the P2ILC programme?

P2I started to develop the P2ILC in January 2019. From the beginning, P2I accepted that learning research integrity should emphasise different foci for different target groups. P2I began by taking the range “from teaching responsible academic writing to educating decision-making processes to memorizing guidelines and codes” (DOA, p. 15) into account.

P2I gained a deeper understanding of the international status quo during the early stages of the project by collecting and mapping dialogical methods to learn research integrity. In a co-creational process with gender experts, P2I weighed the impact of gender on the learning cards. By discussing the learning cards' instructions and the (learning) stories' protagonists, P2I tried to reach a gender-sensitive and balanced learning material. Also, P2I's gender expert accompanied the design process in different meetings and discussions and explained how to raise awareness of gender differences while using the learning material (see the gender

expert's advice in Priess-Buchheit & Haeberlein in press a,b,c). Overall, P2I designed the learning cards and the accompanying handbooks by trial and error as well as by conducting the following three rounds of drafting:

- First, P2I mapped outstanding teaching units as examples for the design process. These are displayed in the [P2I Roadmap](#). Häberlein (2020) also outlined the different development levels of secondary school students, undergraduates and graduates, and early career researchers using interview material and feedback from several meetings. P2I used this information to start the design process of the learning cards and the accompanying handbooks.
- In the second round of drafting, P2I collected feedback from interdisciplinary stakeholders as well as stakeholders from government, industry, academia, and citizens in two international meetings (see pages 8, 9) and several local meetings. Valuable feedback from these meetings and from trainers who reviewed and used the first P2ILC drafts are outlined in Priess-Buchheit (in press). P2I administered many revisions from the first drafts to the final P2ILC programme. P2I made one major adjustment: Feedback showed that secondary school students had difficulties connecting with the original S-series (Priess-Buchheit, in press, and Haeberlein & Claas 2020). By taking the feedback into account, P2I designed a new S0-series, in which the leading design principle changed from research literacy to citizen literacy, and the focus shifted entirely to the left side of figure 1 (towards society, evidence-based decisions and reliable information).
- In the third round of drafting, P2I added different role models and quotes from outstanding researchers to the learning cards. For example, P2I's Polish partner IBE based the selection process on role models' reputation among students, their media activity, and their attention to honest and respectful promotion of both their research and their scientific findings. The role model also had to be known for a) their attention to research integrity in their everyday work, b) their international research experience and c) receiving funds financed by European or international organisations. These role models were added to the P2ILC to reach younger audiences more easily and to encourage them to engage in learning. When looking at the learning cards, learners of the final P2ILC programme see the role models' pictures and names and can connect with these exceptionally talented people and their successful careers. Quotes from the role models accompany their photograph and name on the learning cards. P2I selected quotes that fit each learning card's subfield, provide learners with advice, and reflect the view of the role model. P2I added these quotes to the final version of the learning cards.

The P2ILC Programme shifted step by step to being online ([P2I Website](#), [Zenodo](#), [RIO Journal](#)). Due to the COVID-19 outbreak, P2I has been working on an online solution for the P2ILC programme since April 2020. All learning cards are now integrated into an online learning environment called Moodle, a free and open-source learning management system. The P2ILC online solution is called "learning-p2i". Educators, students, and professionals can use P2I's "learning-p2i" for free. The "learning-p2i" platform (www.learning-p2i.eu) enables learning in groups working collaboratively. This platform is recommended for all trainers that want to learn and teach research integrity. After successfully completing courses with "learning-p2i", participants receive a certificate. It is

currently available in English and will be available in more of the official languages spoken within the European Union soon.

Path 2: Integrity · 5th July · International Begegnungszentrum

(INTER)-DISCIPLINARITY of TEACHING RI

Today we'll go through and **STRENGTHEN** our RI learning materials

This is our **title story**

Let's go through one learning unit and break it down!

and these are examples of learning units

Participatory Workshop

(DE)CONSTRUCTION

First: Pick a situation in your discipline that presents a challenge

Then: roleplay and refine the learning unit

FEEDBACK & IMPROVEMENT

- not necessarily applicable for non-research masters
- use key words that are clearly defined, like research procedures
- is this a good way to teach RI? depends how much time you have!
- ... should we give students more choice on how to learn this?

(RE)CONSTRUCTIVE

HUMANITIES (philosophy)

- it's difficult to find an example in philosophy and law
- clearly defining things like methodology is important
- what even is methodology in phil. and law?
- The cases should be more specific. For instance, a student wants to test a non-established model, but the supervisor says no!
- The student wants to try something new
- The professor may feel obliged to be reliable to funders

BIOMEDICAL / natural sciences

- The two conflicting reasons are: 1. do the experiment that was planned, and 2. consider how close to the AI method
- we considered the pressures: deadline, funding (eg. BfArM), fear of failing, embarrassment, peer pressure

SOCIAL SCIENCES

- we considered two challenging situations for roleplay
- Signing a confidentiality agreement
- Students have a deadline, but discover the dataset they're using - which is peer reviewed - is flawed
- it's important to consider problematic incentive structures!
- what about a case where a student doesn't get signed consent?
- or maybe it's an argument between students?
- Just the professor says go ahead anyway!

Feedback from the international P2I meeting (5th of July 2019)

SESSION 1

Identify and describe your TARGET GROUP

message and language is important

it's difficult when the group is so heterogeneous

Self-expression is important

Think about what motivates someone to become a researcher



Feedback from the international P2I mini-conference (October 2019)

3 What is the Path2Integrity Learning Card Programme?

The P2ILC programme is available in printed folders. It offers materials for trainers who teach groups of between 4–35 learners onsite. Also, P2ILC is available in an online environment (www.learning-p2i.eu) for trainers who teach groups of between 4–300 learners online. Figure 2 shows the complete P2ILC programme. The material is available for download on the project website and is published as part of Path2Integrity's Open Science Collection in the RIO Journal.

Direct Target Group	for trainers who teach groups of between 4–35 learners (recommended age of participants 16-99) onsite			
	for trainers who teach groups of between 4–300 learners (recommended age of participants 16-99) online			
Indirect Target Group	for learners who have no identity in their field of study yet		for learners who (are beginning to) have an identity in their field of study	for learners who (are beginning to) have an identity in their field of study
Group Composition	free		from one field of study	from different fields of study
Aim	citizen literacy	compliance and research literacy	compliance and research literacy	compliance and research literacy
Denomination	pre-disciplinary		disciplinary	post-/ interdisciplinary
Code	S0	S	M	Y

Figure 2: The complete P2ILC-Programme

4 How sustainable are the P2I handbooks of instruction?

By translating the materials into different European languages, transferring them to an online learning environment, and using a digital review section, Path2Integrity has made its P2ILC programme sustainable.

Different learning cards are available in various European languages. Gender experts are co-leading the process of translating the learning cards while emphasizing a transfer of the gender-sensitive English original into the P2I partners' languages.

Path2Integrity developed a digital section for the P2ILC in RIO Journal with comment and enlargement functions. The enlargement functions enabled stakeholders to contribute to the expansion and improvement of the materials. Using these functions, interested persons could comment on specific sections where they believed that changes were required. Additionally, stakeholders (such as the Path2Integrity Community and the Path2Integrity Stakeholder Panel) had the option to invite one another for an open peer review to ensure the quality of

the materials. The platform also supports a post-publication open review, along with the option for an annotated assertion. The adapted form, alongside the original one, is available for review to the general public.

This system allows P2I to take on the development process. The very first version of P2ILC used RIO's in-built capability to generate comments and suggestions from reviewers. At this early development stage, there was only restricted access within the Path2Integrity consortium. The latest version of the handbooks is open access, and P2I will include all further changes in the review section.

The P2I online environment also allows trainers to export the digital learning courses in their own moodle system. There, P2I or future working groups can adjust the learning courses to the trainers' and students' needs. Trainers have already begun to export the digital courses, and the training centre will enable this transfer until the end of the project.

5 Literature

DOA – Description of Action (2019) GRANT AGREEMENT NUMBER 824488 – Path2Integrity, work packages, not published.

Häberlein, L., Claas, O., Dwojak-Matras, A., Kalinowska-Sinkowska, A., Koterwas, A., Prieß-Buchheit, J. (2019). *Path2Integrity roadmap*. Deliverable D3.1 EU Horizon 2020 Path2Integrity project, Grant agreement No 824488. Available at: <https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e5c3d6ba94&appId=PPGMS>.

Häberlein L, Claas O (2020) Dataset: Feedback on the Path2Integrity learning cards for research integrity. Research Ideas and Outcomes 6: e58434. <https://doi.org/10.3897/rio.6.e58434>.

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

Priess-Buchheit & Häberlein, L. (in press c) Handbook for Trainers and Lecturers - Y-Series: Integrity in Research and Society, Research Ideas and Outcomes 6, RIO Journal.

Priess-Buchheit & Häberlein, L. (in press b) Handbook for Trainers and Lecturers - M-Series: Integrity in Research and Society, Research Ideas and Outcomes 6, RIO Journal.

Priess-Buchheit & Häberlein, L. (in press a) Handbook for Teachers and Trainers- S-Series: Integrity in Research and Society, Research Ideas and Outcomes 6, RIO Journal.

Priess-Buchheit, J. (in press) Path2Integrity Learning Cards: First-Year Experiences of an Educational Programme to Foster Research Integrity in Europe, EDUKACJA.

Prieß-Buchheit J, Aro AR, Demirova I, Lanzerath D, Stoev P, Wilder N (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>.

- 6 Appendix 1: How does the P2ILC look for the post- and interdisciplinary target group, for the disciplinary target group, and for the pre-disciplinary target group?**

Subject to change

Path  Integrity

Handbook for Trainers and Lecturers

*Integrity in Research
and Society*

Y-Series



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Subject to change

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).

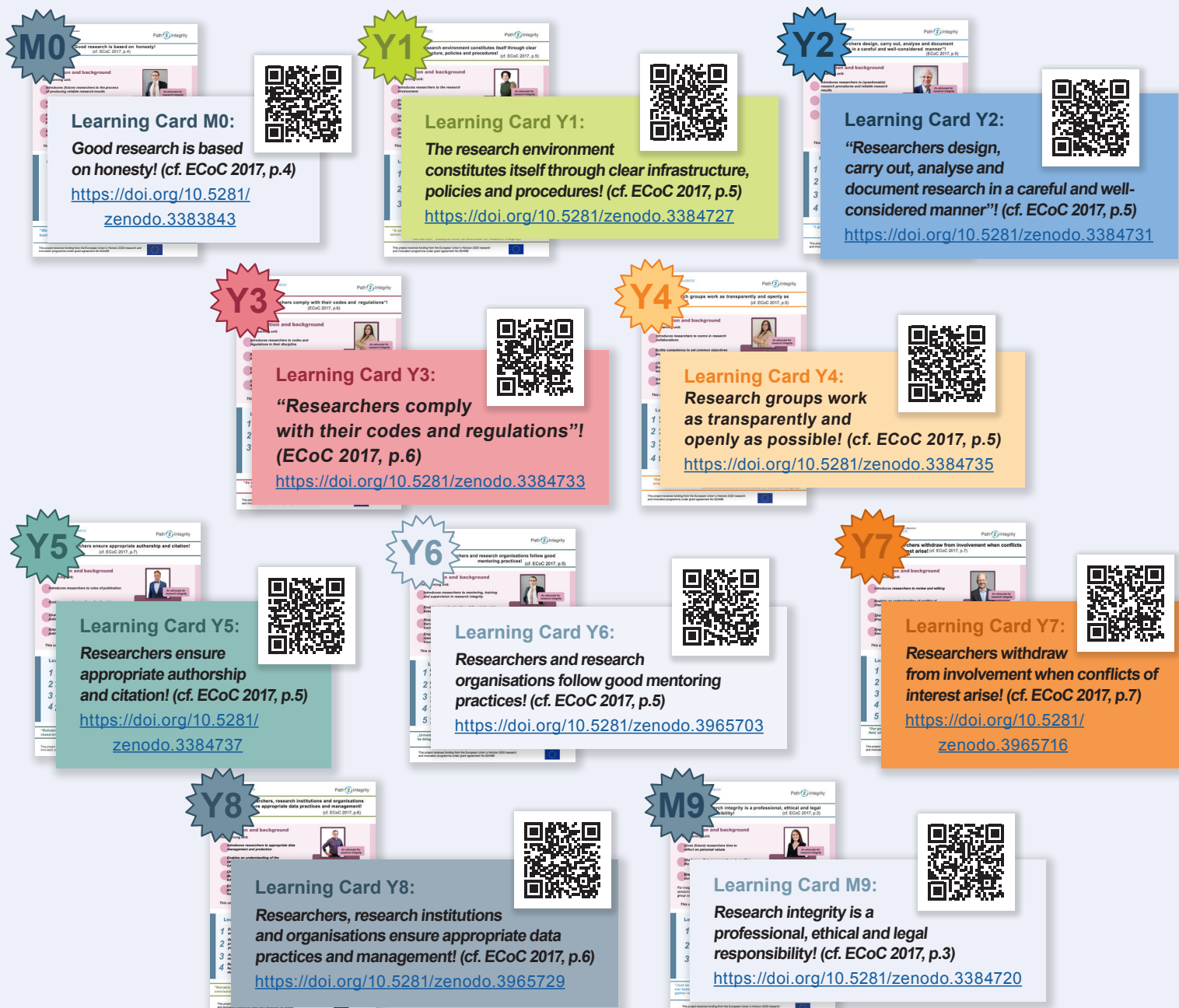


Figure 1: The Path2Integrity Y-series learning cards

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).

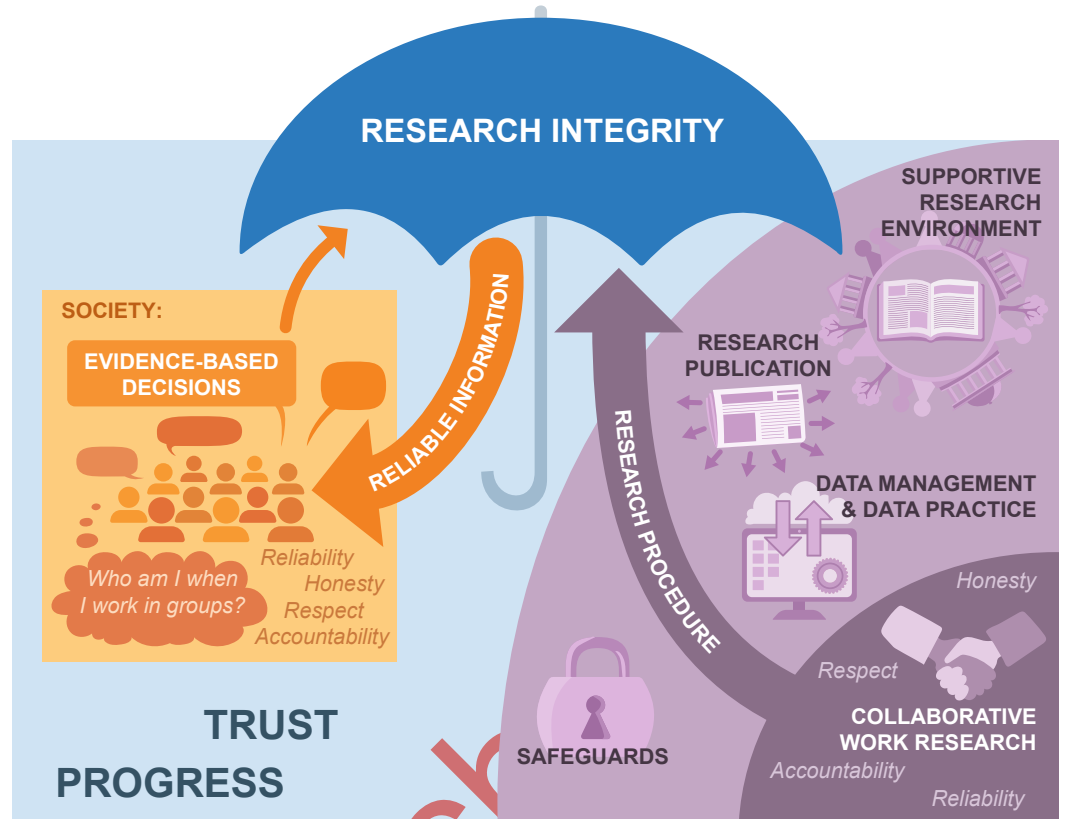


Figure 2: Integrity in research and society

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.

“ 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.

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.

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 **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).

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>).

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.

Figure 3: Path2Integrity learning card first page

“When I started using the P2I learning cards in November 2019, I 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-datvhmf0>) 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



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

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.

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

1. 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 motivation². 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 roadmap (<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).

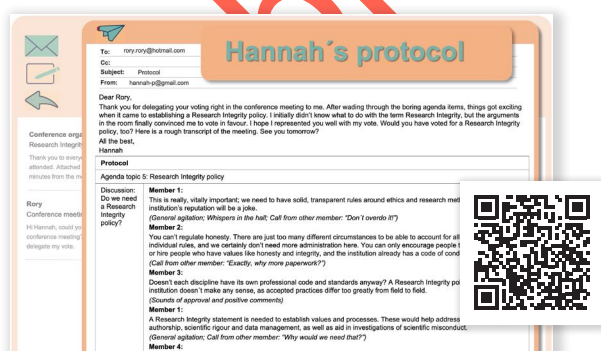


Figure 6: *Hannah's protocol – Is there a need for a research integrity policy?*

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.

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.

“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; Strohmets 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 experienced⁹. 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 direction¹¹:

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.

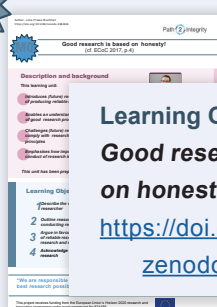
12 Prieß-Buchheit et al. 2020, 20.

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 convince 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

M0



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



Links from learning card M0:

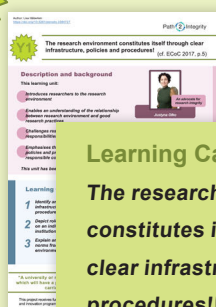
Evaluation of the learning units: <https://path2integrity.eu/limesurvey/index.php/714871?newtest=Y&lang=en>



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.

Figure 11: M0 learning card

Y1



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>



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



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.

“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.

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:

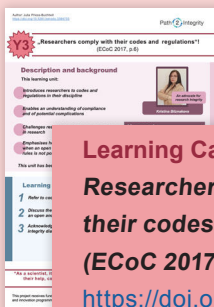
The Economic and Social Research Council (ESRC) helps researchers consider ethics issues throughout the complete life cycle of a project. Case studies, listed under a specific ethics issues category, aim to raise awareness of some of the ethics issues that can arise in research. <https://esrc.ukri.org/funding/guidance-for-applicants/research-ethics/ethics-case-s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



“ 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.

Figure 13: Y2 learning card

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.

“ 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.

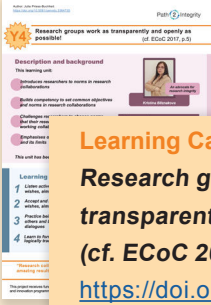
Links from learning card Y3:

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



Figure 14: Y3 learning card

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>

“ 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.

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.

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:

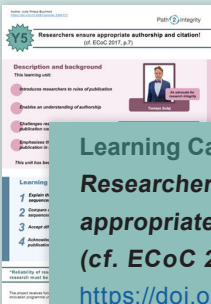
The University of Sheffield provides information on acceptable practices in research collaborations and innovation <https://www.sheffield.ac.uk/rs/>



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>

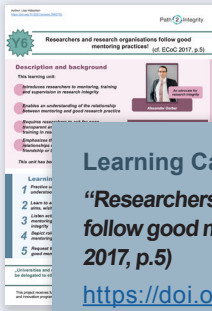


The document “Why do we even give sources?” presents a list of reasons why we give sources. The reasons can be collected by participants. <https://www.academicintegrity.eu/wp/materials/why-do-we-even-give-sources-a-list-of-reasons-for-good-practice-maintaining-integrity/>



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>

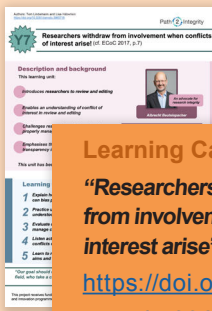


5 Qualities of Good Research Mentors: <https://ori.hhs.gov/sites/default/files/2018-09/5%20Qualities%20of%20Good%20Research%20Mentors.pdf>



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>

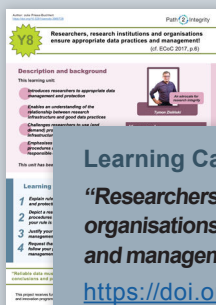


COPE’s ethical guidelines for peer reviewers: <https://publicationethics.org/node/19886>



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.

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

“ 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.

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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

Subject to change





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)





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.

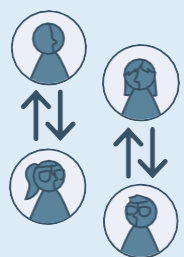
Turn it to its best. Now rewrite your story! Together, imagine that another researcher steps in to stop the cheating. Describe this researcher's values, as well as how your character is now able to use reliable research results to make their argument. Write a short story in which a person or part of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





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)**





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?



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.

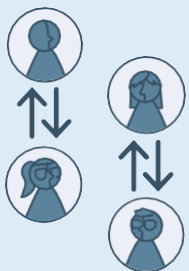
Read your stories aloud!

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.





“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)





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.

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.

European Code
of Conduct for
Research Integrity:



3 Engage in role play:

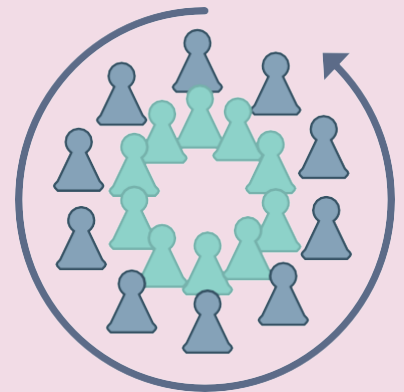
Come together and greet each other. Prepare the room for an evaluation “speed dating” circle with as many chairs as people. Decide which side will stay seated and which will move on.

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:

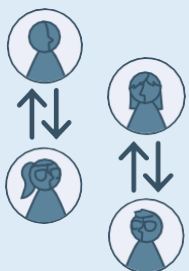
On your own, consider what the evaluation speed dating introduced. Choose one of the six questions on research procedures from above for which the speed dating raised uncertainty for your research project. Take your time.

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”.



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)

Y3 Path 2 Integrity



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.

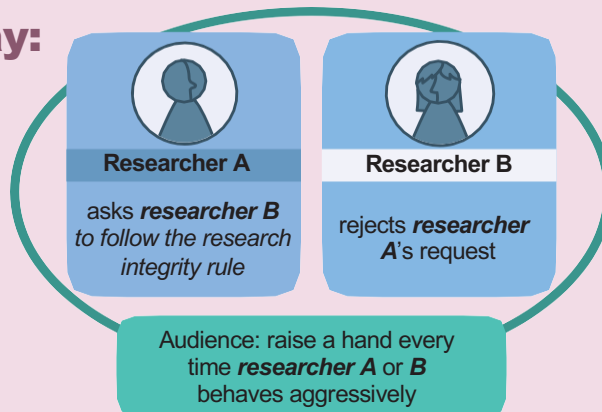
2 Immerse yourself in rules relevant to your discipline:

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*)



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)





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!



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.

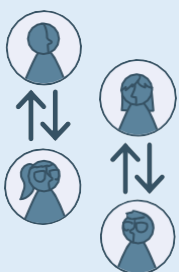
Take one rule/norm from your agreement paragraph and discuss how each of your actions would look if you adhered to this rule.

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?



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)





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:



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)

- 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

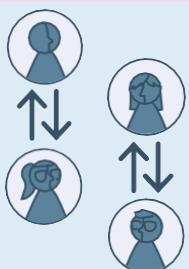
Read your stories aloud!

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?



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)





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:

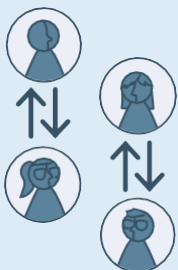
Discuss the following questions in class:

- 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.





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)





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.

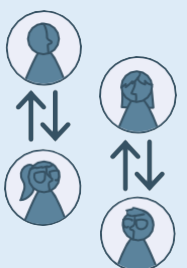
Put one of the collections on the wall and meet in front of it as a class.

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?





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)





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.

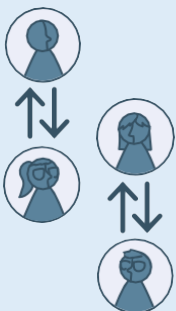
5 Reflect on appropriate data practices and management:

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.





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.

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



An advocate for research integrity

Anna Wójcicka

Keywords

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

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)





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.

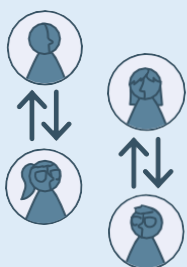
Everybody picks somebody's value from the wall. Describe this value to your class by giving an example of various actions conducted by a researcher who embodies this value. Let the individuals who wrote down the values add any examples of researchers' actions, if they want.

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!



Path  Integrity

Handbook for Trainers and Lecturers

*Integrity in Research
and Society*

M-Series



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Subject to change

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 future researchers how to integrate their knowledge into their own research activities, as well as help them understand how important reliable research is for society? This handbook accompanies the **Path2Integrity learning cards (P2ILC)** on six topics (<https://www.path2integrity.eu/ri-materials>) and introduces you to an easy and fun learning programme that has been evaluated in over 15 training sessions. The Path2Integrity learning cards M-series is especially designed for graduates who already have a university degree. They learn how responsible research needs to be conducted in order to be reliable and thus useful for society.

The M-series learning cards help students use research findings responsibly while understanding the research landscape and processes within it, and by appreciating the importance of research integrity's criteria for society (cf. Häberlein 2020, 6f.). With the aid of many experienced teachers and trainers, the authors collected tips in this handbook on how to prepare each card, how to support your students' learning curve, and how to overcome the various challenges that might arise as you bring this important topic to your students.

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).

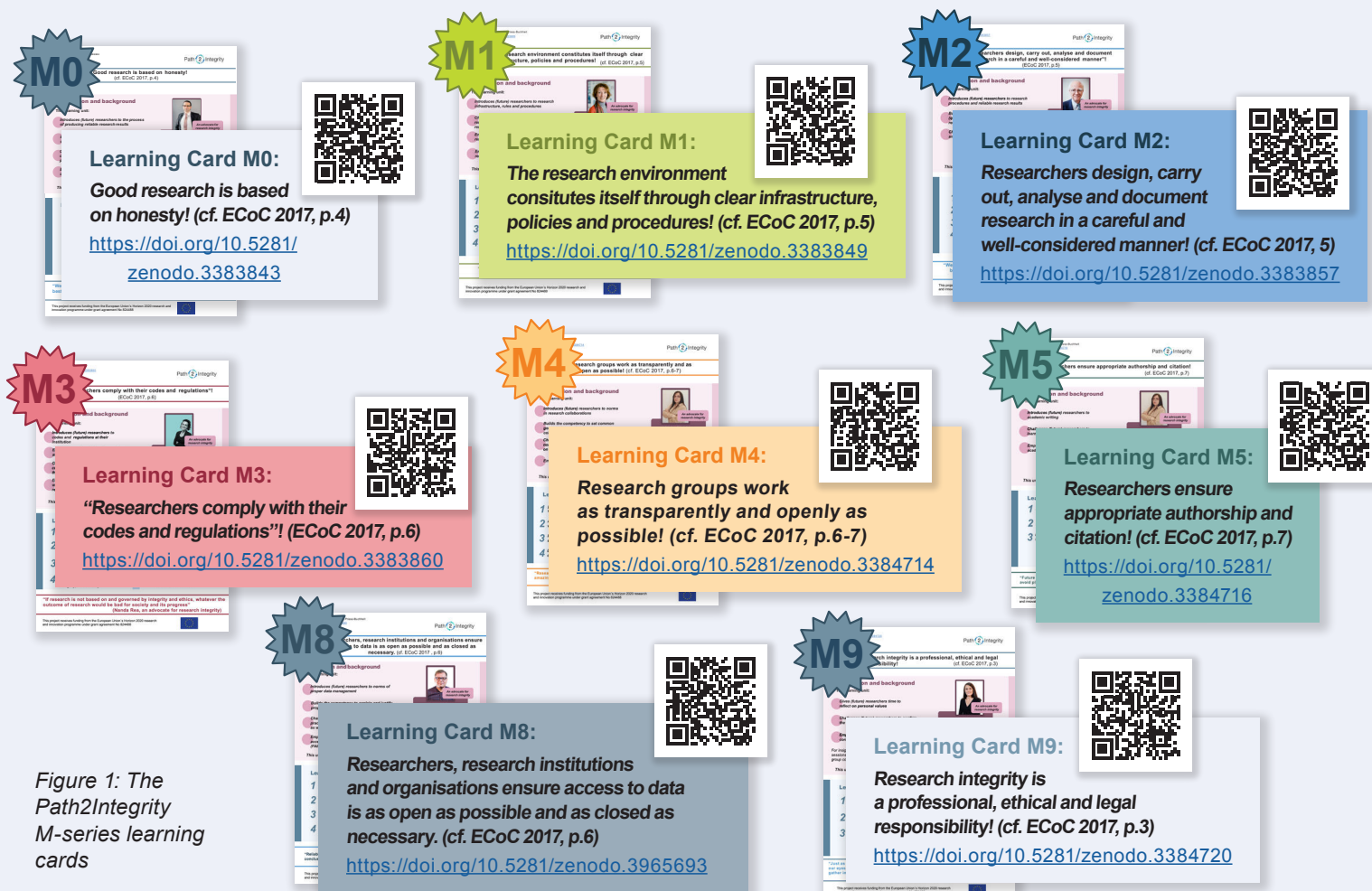


Figure 1: The Path2Integrity M-series learning cards

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).

“I introduced my students to the subject of safeguards and existing codes and regulations when I used the cards in a course for masters students of healthcare in 2019. As graduates, they already had a lot of knowledge in their field of research, but had no understanding of research integrity at first. Still, they could immediately see the connection in terms of research integrity and their own discipline and research activity. We discussed which regulations are particularly important in healthcare and they realised that the research community follows certain principles that guarantee good research and reliable research results.

As a cornerstone of the Path2Integrity learning card programme, students “[...] 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

1 Prieß-Buchheit et al. 2020, 23, <https://doi.org/10.3897/info.6.653921>.

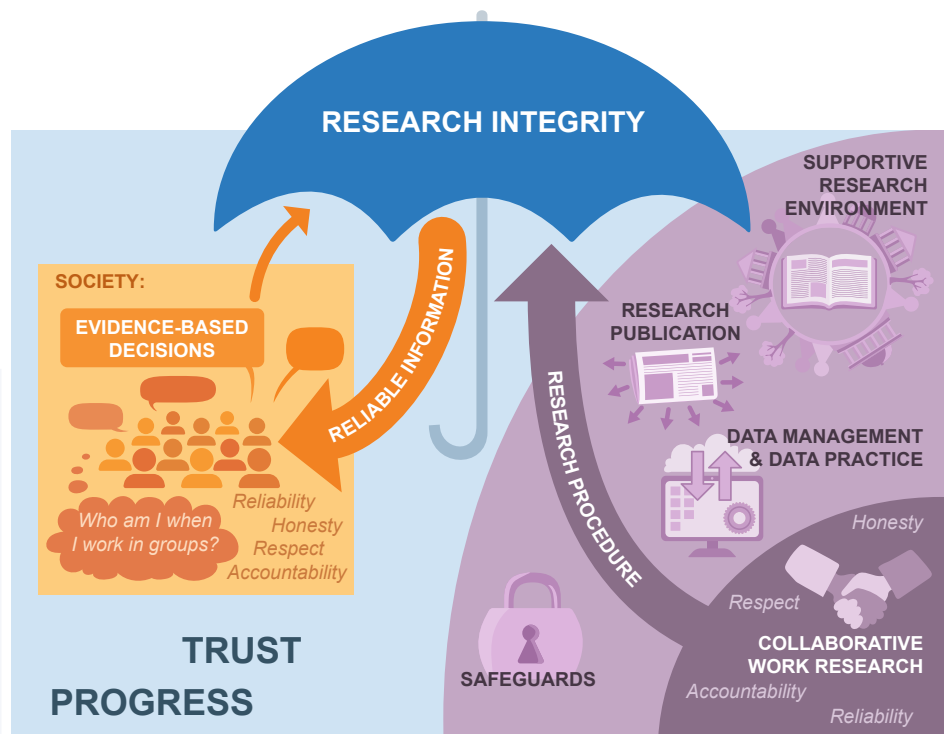


Figure 2: Integrity in research and society

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 M-series. If you are interested in material prepared for secondary school students and undergraduates or post-graduates, switch to the handbook for the S-series for pre-disciplinary settings or the Y-series for interdisciplinary 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 future researchers to develop their own standpoint based on sound arguments, and to be able to demand integrity in research and society.

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>).

“The design of the cards and the step-by-step procedure especially motivated my students when I used four learning cards from the M-series last semester. They also liked the active exercises, and found these exciting and engaging. In the session “Researchers comply with their codes and regulations!”, I outlined the exercises from the sheet in detail and made reference to the students’ prior experience in my explanations in order to enable them to relate to the topic. When we started to do the role-playing, this encouraged people to ask specific questions about their own area of research. It made me realise what an advanced level of study they’re already at. I just supported them whenever questions arose; that has helped a great deal.

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. 3). 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.

Figure 3: Path2Integrity learning card first page

“When I started using the P2I learning cards in November 2019, I 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 M-series (<https://www.youtube.com/watch?v=ft-datvhmfo>, Fig 4) 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 research area, public health, and decided to start with joint brainstorming on a possible research landscape to ease them into a good working mood. Since they needed a little assistance here, I provided examples related to the different roles in exercise three and four so that students could identify specific stakeholders. It worked out great and helped get my students 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 in our discipline. I enjoyed how much fun we had, and continued using the cards in future classes.

After the third session, my students 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 M-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 students 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 motivation². 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 **“Eight sessions on integrity in research and society”** on page 11 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 roadmap (<https://www.path2integrity.eu/teaching-RI> Fig. 5).



Figure 5: Path2Integrity roadmap

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

Hannah’s protocol is a narrative from the Path2Integrity learning card programme, in which research integrity is at stake. The narrative is introduced in M0 and subsequently used in several cards 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 students loved the pink sections of the learning cards, which emphasise taking a dialogical approach to Hannah’s protocol narrative.

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 a 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).

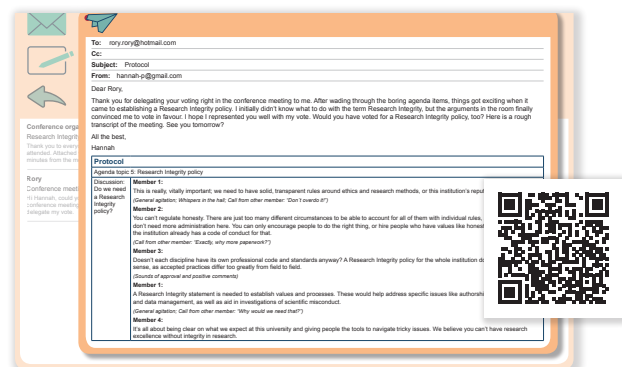


Figure 6: Hannah’s protocol – Is there a need for a research integrity policy?

2 For further information see Nimmerfroh 2016.

“ When we reviewed what Hannah’s protocol entailed, my students 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 M1, my course listened to different statements from their peers, outlined their knowledge, and started to discuss power structures in the context of Hannah’s protocol. They began to develop and rationalise their own arguments for the importance of integrity in research and society.

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, graduates 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

can influence their point of view. Using their own words and expressing both common and diverse views, they tell short stories e.g. about rules for appropriate citation, the possibility of fostering research integrity in the research landscape or reasons for reliable research results for both research and society.

Learning with storytelling invites participants 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

In the storytelling exercises contained in the P2ILC, participants articulate how they interpret concepts like research integrity or how occurrences of e.g. mistrust

“ When I asked participants in my course to write an email to Hannah giving tips for correct citation in our M5 session, they really got into it, referring to common citation rules from our discipline. Participants enjoyed using specific citation styles and supporting Hannah.

At one point, I intervened and pointed out that ‘Hannah’s protocol - Is there a need for a research integrity policy?’ is a fictional narrative that can develop in different ways, so they created advice that worked for different contexts. The peer correction of citation in exercise four was fun 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.

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.

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. Löffström 2012, 349 in reference to Clarkburn 2002, Sirin et al. 2003, Sparks and Hunt 1998, DeNeve and Heppner 1997; Grose-Fifer 2017; Löffström 2016; McCarthy and Anderson 2000; McWilliams and Nahavandi 2006; Poling and Hupp 2009; Poorman 2002; Rosnow 1990; Strohmets and Skleder 1992.

“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 engage questionable research procedures and research results, as well as possible solutions 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 ensuring that participants thoughtfully addressed the learning content of learning card M2 “Researchers design, carry out, analyse and document research in a careful and well-considered manner”. 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 themselves as researchers in a situation in which they are unsure about how to proceed. How could they prioritise different research procedures? What are the consequences? Why would this or that action be good or bad for science and society? We discussed which action should be referred to as good scientific practice or misconduct. This allowed my students to delve into the scenario more deeply. We tried the role play once again and it worked much better.

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 group out of the scenario by allowing them to summarise and evaluate what they have experienced⁹. 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.

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, future 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 future researchers' 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 future 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 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, students 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

10 cf. Wilder et al. 2020, 15.

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.

If participants are not used to actively contributing, trainers can facilitate a smooth transition into the exercise by allowing the future 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 students to take a new direction¹¹:

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.
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 convince 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 M5:
 - a) **Explain the importance of citation;**
 - b) **Weigh criteria for good academic writing;**
 - c) **Prioritise appropriate academic writing.**

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:

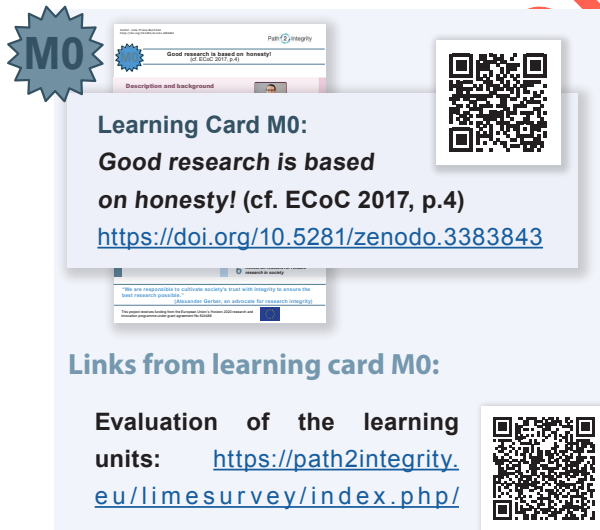
One challenge within dialogical learning settings can be the lack of eye-level conversations between different genders. Within the Path2Integrity project, the gender dimension has been observed to play a role in interactive sessions. “Storytelling and role play are often gender-mixed interactions in 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. 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.

Eight sessions on integrity in research and society



MO

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

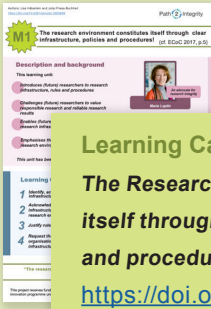
Links from learning card M0:

Evaluation of the learning units: <https://path2integrity.eu/limesurvey/index.php/>

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.

Figure 11: M0 learning card

M1



Learning Card M1:
The Research Environment constitutes itself through clear infrastructure, policies and procedures! (cf. ECoC 2017, p.5)
<https://doi.org/10.5281/zenodo.3383849>

This learning card draws learners' attention to the fact that good research is integrated into a larger environment that is characterised by a clear infrastructure, principles and procedures. Participants get to know the rules and regulations of the broader scientific community in five learning steps. They engage in role play and reflect on how to require a research landscape to provide an infrastructure that promotes honest research.

“ Since my teaching experience has taught me that students, even if they already have specific knowledge in their field, are often not yet familiar with the technical terms, I started to introduce them to the terms ‘research community’, ‘funding agency’ and ‘whistleblower’ using the definitions in the infographic from the learning card. This was a good move, because my students were not yet familiar with the idea of a ‘research environment’ so I tried to actively support learners in making use of the infrastructure of the research landscape.

Links from learning card M1:

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>



The Research Community Safeguards: https://ori.hhs.gov/sites/default/files/2018-04/3_Should_You_Trust_Science.pdf



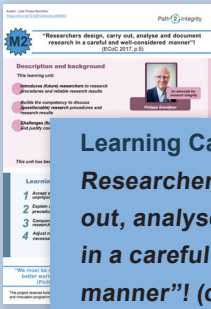
If it works for your course, you can also use the following additional material:

The lecture “Why do ethics matter?” is a 20-minute video by Shefali Roy, who has spent most of her career in the field of ethics and compliance. It deals with the importance of ethics in practice and was held on a TEDx-event. You can ask learners to watch the video and to reflect on how important ethics is to them. What values do they bring to their institution? <https://www.youtube.com/watch?v=yesE4mcv4CM>



Figure 12: M1 learning card

M2



Learning Card M2:
Researchers design, carry out, analyse and document research in a careful and well-considered manner”! (cf. ECoC 2017, 5)
<https://doi.org/10.5281/zenodo.3383857>

This learning card introduces learners 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.

“ Before we dealt with an example from research practice, we discussed what ‘Responsible Research Conduct’ and ‘Reliable Research Results’ actually mean and once again looked at the values and norms mentioned in the ECoC. The yellow box on the M2 learning card was very helpful to remind us of basic knowledge about research integrity beforehand.

Links from learning card M2:

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 science comic from digital architect Patrick Hochstenbach “Anatomy of scientific bias” illustrates clear messages regarding norms in research procedures. https://hochstenbach.files.wordpress.com/2017/02/scientific_bias_600dpi_rgb.jpg?w=710



Figure 13: M2 learning card

M3



Learning Card M3:
“Researchers comply with their codes and regulations”! (ECoC 2017, p.6)
<https://doi.org/10.5281/zenodo.3383860>

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 five 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: M3 learning card

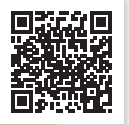
Links from learning card M3:

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>



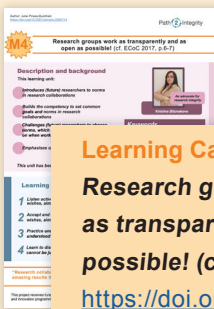
If it works for your course, you can also use the following additional material:

In the approx. 15 minute video “**Research Integrity and Ethics**“, Wilna Venter, M.A., M.Ed., cluster manager for strategic support in the research office of the University of Cape Town, presents the historical background, the definition and the conduct of responsible research: <https://www.youtube.com/watch?v=vxNqGtNHPb0>



“ For exercise 4, we first discussed the ‘Safekeepers of Research Integrity’ together, which are named on the learning card in the yellow box; this helped my participants to think about next steps in a situation where a dialogue on research integrity is not possible. They realised that there are ways to get help.

M4



Learning Card M4:
Research groups work as transparently and as open as possible! (cf. ECoC 2017, p.6-7)
<https://doi.org/10.5281/zenodo.3384714>

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.

Figure 15: M4 learning card

Links from learning card M4:

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>



Building a Foundation: https://www.path2integrity.eu/teaching-RI/content/collaborative_work

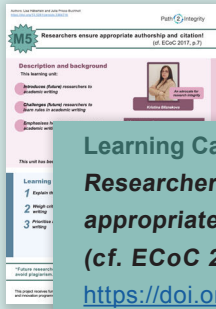


If it works for your course, you can also use the following additional material:

The popular TV series “The Big Bang Theory” is about researchers from various disciplines. This sequence deals with a humorous discussion on research collaboration between the two characters Amy and Sheldon <https://www.youtube.com/watch?v=XgrQpLn7Lac>



M5



Learning Card M5:
Researchers ensure appropriate authorship and citation!
(cf. ECoC 2017, p.7)
<https://doi.org/10.5281/zenodo.3384716>

This learning card covers the topic of scientific writing and authorship and introduces learners to the rules of research publication in four learning steps. In storytelling, participants explain the meaning of citations and references, weigh criteria of scientific writing and prioritise honest scientific writing over poor research practice and plagiarism.

“When we worked on the M5 card together, focusing on correct authorship and citation, my students started to ask questions about their seminar papers and final theses. So, I took this opportunity to encourage individual questions on scientific writing.

Links from the learning card M5:

Write ethically from start to finish: https://ori.hhs.gov/sites/default/files/2017-12/8_Ethical_Write.pdf



Tips for Avoiding Plagiarism: https://ori.hhs.gov/sites/default/files/2019-02/Tips%20for%20Avoiding%20Plagiarism_Rasterized.pdf



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>



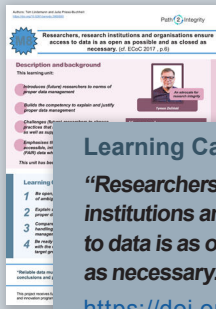
If it works for your course, you can also use the following additional material:

The 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: M5 learning card

M8



Learning Card M8:
“Researchers, research institutions and organisations ensure access to data is as open as possible and as closed as necessary.” (cf. ECoC 2017, p.7)
<https://doi.org/10.5281/zenodo.3965693>

This learning card introduces (future) researchers to norms of proper data management and addresses the issue of open access data. In five learning steps, participants engage in role play and choose data practices that respect the rights of others as well as support their own work while comparing and prioritising different handlings of proper data management.

“I’m a fan of encouraging discussion. Still, I did moderate controversy in the participants’ discussions to prevent emotions flaring. I wanted to keep the balance between what Retzmann, an economics education expert, calls “involvement and distance” and decided to provide my students with decision matrixes to help them clarify the advantages, disadvantages and consequences of alternative decision options. It’s great that the learning cards allow you to be so flexible.

Links from the learning card M8:

FAIR Principles: www.go-fair.org



Figure 17: M8 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://www.ncbi.nlm.nih.gov/books/NBK547546/>

Figure 18: M9 learning card

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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.3383849> Learning Card M1

<https://doi.org/10.5281/zenodo.3383857> Learning Card M2

<https://doi.org/10.5281/zenodo.3383860> Learning Card M3

<https://doi.org/10.5281/zenodo.3384714> Learning Card M4

<https://doi.org/10.5281/zenodo.3384716> Learning Card M5

<https://doi.org/10.5281/zenodo.3965693> Learning Card M8

<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 M-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://ori.hhs.gov/sites/default/files/2018-04/3_Should_You_Trust_Science.pdf Infographic on "The research community safeguards"

https://www.path2integrity.eu/teaching-RI/content/collaborative_work Path2Integrity comic: "Building a Foundation"

https://ori.hhs.gov/sites/default/files/2017-12/8_Ethical_Write.pdf Infographic on "Write ethically from start to finish"

https://ori.hhs.gov/sites/default/files/2019-02/Tips%20for%20Avoiding%20Plagiarism_Rasterized.pdf Infographic on "Tips for Avoiding Plagiarism"

www.go-fair.org FAIR Principles





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)





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.

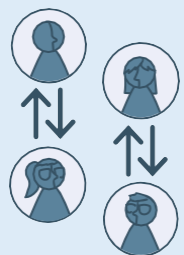
Turn it to its best. Now rewrite your story! Together, imagine that another researcher steps in to stop the cheating. Describe this researcher's values, as well as how your character is now able to use reliable research results to make their argument. Write a short story in which a person or part of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



M1

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

Description and background

This learning unit:

Introduces (future) researchers to research infrastructure, rules and procedures

Challenges (future) researchers to value responsible research and reliable research results

Enables (future) researchers to realise research infrastructure, rules and procedures

Emphasises that research is embedded in a research environment



An advocate for research integrity

Maria Leptin

Keywords

Research environment; research community; research infrastructure; rules and procedures

This unit has been prepared for disciplinary learning groups.

Learning objectives

- 1** *Identify, accept and actively use research infrastructure, rules and procedures*
- 2** *Learn about research infrastructure and the structure of one research environment in particular*
- 3** *Justify rules for good research practice*
- 4** *Request that research institutions and organisations provide proper infrastructure*

Learning stages

- 1** *Become familiar with the topic*
- 2** *Dive into an interesting story*
- 3** *Engage in storytelling*
- 4** *Put the pieces together*
- 5** *Reflect on the research environment*

**“The research community must work together to promote research integrity.”
(Maria Leptin, an advocate for research integrity)**





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”

Bring the complete code with you to class, and discuss the meanings of any unknown words.

[European Code of Conduct for Research Integrity](#)



2 Dive into an interesting story:

Read or recall together Hannah’s protocol and briefly flesh out what happened in the meeting. The protocol shows arguments against a research integrity policy. Take your time and consider arguments in favour of a research integrity policy. To do so, carefully read the preamble of The European Code of Conduct for Research Integrity (use QR code or link above).

Write your arguments into your notebook!

3 Engage in storytelling:

Choose one person in your class to be a moderator that leads you through the next steps. Move all tables and chairs aside.

Get into groups of three or four, and select one of the following roles for your group:

Part 1: Head of your research faculty

Part 2: Head of a funding agency important in your field

Part 3: Whistleblower

Part 4: Representative of the government

Part 5: Representative of your researchers community

Part 6: Editor of a scientific journal from your field

Part 7: Representative of the early career researchers from your field

[Research Community Safeguards](#)



Familiarise yourself with your role. What guidelines, procedures or infrastructure does your role entail in order to foster good research practice?

Find some online references that outline what your role does in order to foster good research practice. Pick three or four of the most important ways in which it does this, such as rules, procedures or infrastructures. Each of you should familiarise yourself with one way to foster good research practice. Present them in big letters on a piece of paper.

4 Put the pieces together: 5 Reflect on the research environment:

Spread out in the room, holding up your paper. Read what others have written on their papers and find someone whose message goes well with yours.

Together, brainstorm a research landscape for your discipline.

Draw the landscape on a piece of paper, and have it photocopied so that it can be passed around.

Meanwhile, start a question-and-answer circle around the room. One person should ask their neighbour: *How and why do you foster research integrity?* The neighbour should answer as clearly as possible and then ask the next student the same question. This should continue until everyone has both asked and answered.

Move the tables and chairs back to discuss the activity as a class.

Together, agree on the most important part of the research landscape for your discipline.

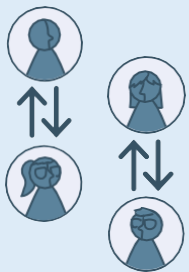
Who was missing in your portrayal?

Where was there a lack of clear infrastructure, rules or procedures in your discipline?

Formulate three statements with the words: *The research environment in our discipline should _____!*

Copy these statements into your notebook.

How can you handle these leaps in your upcoming research? Find solutions together!





“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 (future) researchers to research procedures and reliable research results

Builds the competency to discuss (questionable) research procedures and research results

Challenges (future) researchers to explain and justify complex research norms



An advocate for research integrity

Philippe Grandjean

Keywords

Responsible research conduct; reliable research results; questionable research practice; misconduct

This unit has been prepared for disciplinary 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** *Adjust research procedures, if necessary*

Learning stages

- 1** *Become familiar with the topic*
- 2** *Dive into an interesting challenge*
- 3** *Engage in role play*
- 4** *Explain and justify research rules*
- 5** *Evaluate different arguments, face dissent and achieve consensus*

“We must be neutral and represent the best of science to help make this a better world for all of us. We have to figure out how we can do that.”
(Philippe Grandjean, an advocate for research integrity)





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.

European Code
of Conduct for
Research Integrity



2 Dive into an interesting challenge:

To prepare the following exercise, please choose a situation in which some of you are unsure about how to proceed.

This challenge, regarding model procedures in the natural sciences, shows some uncertainty as to how best to proceed: *A new approach on modelling particle behaviour has been introduced to a researcher at a conference; however, it conflicts with the model he currently uses. Does he have to address this in his next paper and presentation or can he just let it go, as the model he uses is already well accepted within the community?*

Likewise, the following challenge demonstrates a questionable situation with vulnerable populations: *You are running a social media experiment and receive a request from a colleague: “Please let Paul attend your experiment as he needs the money.” Should you invite Paul to attend?*

In the field of research on self-driving cars, an expert questions the following: *Is it necessary to check the alarm system for distance control before every test run in the city?*

If one of these challenges is relevant to your discipline, you are welcome to use it. If not, please select an equivalent challenge from your research. Display it with one or two sentences on the chalkboard.

3 Engage in role play:

Go through the next steps in groups of four to six people:

Flesh out your challenge with details;

Imagine a conflict happens between two parties in this challenge, and perform it in a role play;

Describe the conflict and write it down (each group member needs a text version).

4 Explain and justify research rules:

Reflect on your own and answer the following questions:

Which rules do the parties explicitly or implicitly refer to in your conflict?

Did the parties explain rules in the role play?

If not, can you imagine which rules justify the actions of the two parties?

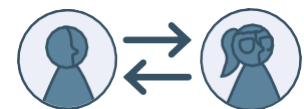
Which rules exclude or at least hinder each other? Write down the relevant rules.

Pick out one rule that you agree with, and a second one that you reject.

Describe why you agree with the first, and why you disagree with the second. If possible, refer to The European Code of Conduct for Research Integrity or another guideline on research procedures, e.g. from your institution or country.

5 Evaluate different arguments, face dissent and achieve consensus:

Discuss your rules in the plenum. Start by arguing in favour of specific research procedures and then turn to your denials.



In the discussion you can use the terms: **responsible research conduct; reliable research results; questionable research practice; misconduct.**



M3

“Researchers comply with codes and regulations relevant to their discipline.”

(ECoC 2017, p. 6)

Description and background

This learning unit:

Introduces (future) researchers to codes and regulations at their institution

Enables an understanding of compliance and of potential complications

Challenges (future) researchers to demand compliance in research codes both from themselves and others

Emphasises how to switch to help mechanisms when an open and transparent dialogue about research rules is not possible



An advocate for research integrity

Nanda Rea

Keywords

Openness and transparency; research codes and regulations; ombudsperson; research ethics committee; person of trust

This unit has been prepared for disciplinary learning groups.

Learning objectives

- 1** ***Refer to codes and regulations***
- 2** ***Realise that aggressive behaviour hinders research integrity***
- 3** ***Establish an environment for complying with research codes and regulations***
- 4** ***Switch to help mechanisms by contacting guardians of research integrity, if necessary***

Learning stages

- 1** ***Become familiar with the topic***
- 2** ***Immerse yourself in rules relevant to your discipline***
- 3** ***Engage in rotatory role play***
- 4** ***Find solutions at your institution***
- 5** ***Reflect on conditions and help mechanisms for an open and transparent dialogue***

“If research is not based on and governed by integrity and ethics, the outcome of research would be bad for society and its progress.”
(Nanda Rea, an advocate for research integrity)





1 Become familiar with the topic:

Homework (before the unit starts) or reading session

Read the paragraph on safeguards in “The European Code of Conduct for Research Integrity”

Find at least two codes or regulations that affect your discipline.

Read them and bring them to your class.

In class, discuss the meanings of any unknown words.

[European Code of Conduct for Research Integrity](#)



2 Immerse yourself in rules relevant to your discipline:

Working in pairs, discuss which codes and regulations from your discipline you brought with you and decide together which rule you value as most important.

Write your chosen rule on a chalk board or flip chart. As a class, agree on the most important rule relevant to your discipline out of all the recommendations. Write this rule in your notebook!

Together with your partner, recall or read Hannah’s protocol. Imagine meeting her; you have two minutes to tell her the rule within your discipline that you have decided on as a class.

3 Engage in rotatory role play:

Go through the next steps in pairs, choosing one student to play A and one to play B:

A has a conflict with their superior B, because B is not adhering to the rule (from your notebook); in fact they have instructed A to ignore this rule. *Flesh out your conflict with details.*

Write down a dialogue of your conflict in which A explains to B that it is both necessary and reasonable to follow this rule. Perform your dialogue in role play! *Refer to codes and regulations.*

Go through this dialogue at least four times with B using different forms of aggressive verbal behaviour to try to prevent A from following this rule. A should continue to address the conflict in an open and transparent way. *Rotate roles for every turn.*

Reflect on the differences between the four turns.

4 Find solutions at your institution:

Come together as a class. Discuss where A can find help in your institution in a situation in which an open and transparent dialogue is not possible.

5 Reflect on conditions and help mechanisms for an open and transparent dialogue:

Answer these questions together as a class, and copy them into your notebook:

- How should an open and transparent dialogue about research rules look like?
- At what point in a conflict is it necessary to stop attempting a dialogue and instead switch to help mechanisms and contact a research integrity guardian?
- What can happen when somebody seeks help from a research integrity guardian?
- Why should every student and researcher feel responsible for ensuring that research rules are complied with?

Guardians of research integrity are:

1. **Ombudspersons** are officially elected to represent the codes and regulations of research integrity at your institution;
2. **Research ethics committees** are elected to assess ethical issues in research projects;
3. **Persons of trust** are trustworthy and experienced in the field of research integrity, in some cases officially appointed by your institution.

M4

Research groups work as transparently and as openly as possible!

(cf. ECoC 2017, pp. 6–7)

Description and background

This learning unit:

- Introduces (future) researchers to norms in research collaborations**
- Builds the competency to set common goals and norms in research collaborations**
- Challenges (future) researchers to choose norms, which all research partners agree on when working collaboratively**
- Emphasises openness and transparency**



An advocate for research integrity

Kristina Bliznakova

Keywords

Roles and responsibilities; research agreements; transparency; openness; research groups; research collaboration; common goals

This unit has been prepared for disciplinary learning groups.

Learning objectives

- 1 Listen actively and present own wishes, aims and goals**
- 2 Accept and learn to respect others' wishes, aims and goals**
- 3 Practice understanding and being understood in a dialogue**
- 4 Learn to discard arguments that cannot be justified**

Learning stages

- 1 Become familiar with the topic**
- 2 Face an interesting problem**
- 3 Write down your wishes, aims and goals**
- 4 Discuss and come to an agreement**
- 5 Reflect on reaching an agreement**

“Research collaborations open doors for joint scientific activities that can provide amazing results that benefit our society.”
(Kristina Bliznakova, an advocate for research integrity)



M4 Path 2 Integrity

1 Become familiar with the topic:

Homework (before the unit starts) or reading session

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

Discuss the meanings of any unknown words.

Look up the Path2Integrity comic “Building a Foundation”.

What does it show? Which values play a role in building a foundation for collaborative work?

[European Code of Conduct for Research Integrity](#)



[Building a Foundation \(Path2Integrity\)](#)



2 Face an interesting problem:

To learn about research integrity in research groups, please select an example from your discipline. Choose a situation in which collaborative work is common. Here are two possible examples:

1. “To promote more female speakers at high-level European conferences, three partners decided to work together on project X3. X3 supports high-level conference hosts by conducting and publishing the results of a survey about the most pressing needs of women while they are at conferences.”
2. “To tackle health challenges in Europe, 15 institutions from different European countries support an experiment with different randomised trials to improve patient care.”

These examples are similar in that they refer to collaborative teams pursuing scientific results using known and state-of-the-art research procedures. If one of these examples is relevant to you, you are welcome to use it. If not, please select an equivalent example from your discipline. Write it down in one or two sentences.

3 Write down your wishes, aims and goals:

- 1 Working alone, imagine that you take on the role of a researcher in the example you have chosen. Flesh this out in detail. What are your tasks and responsibilities?
- 2 You do not know who your partners will be. Write down which research practices they might use that would jeopardise the research collaboration.
- 3 Consider what you would need from your project partners so as not to step into this pitfall.
- 4 Write down on what you and your partners should agree together in advance of the project so that you can confidently start your project without hesitation or discomfort.

Be transparent and open!



What are the roles and responsibilities of the different partners in research collaborations?

Think about processes such as research reporting on findings and problems, collecting and storing information, changing research design or models etc.

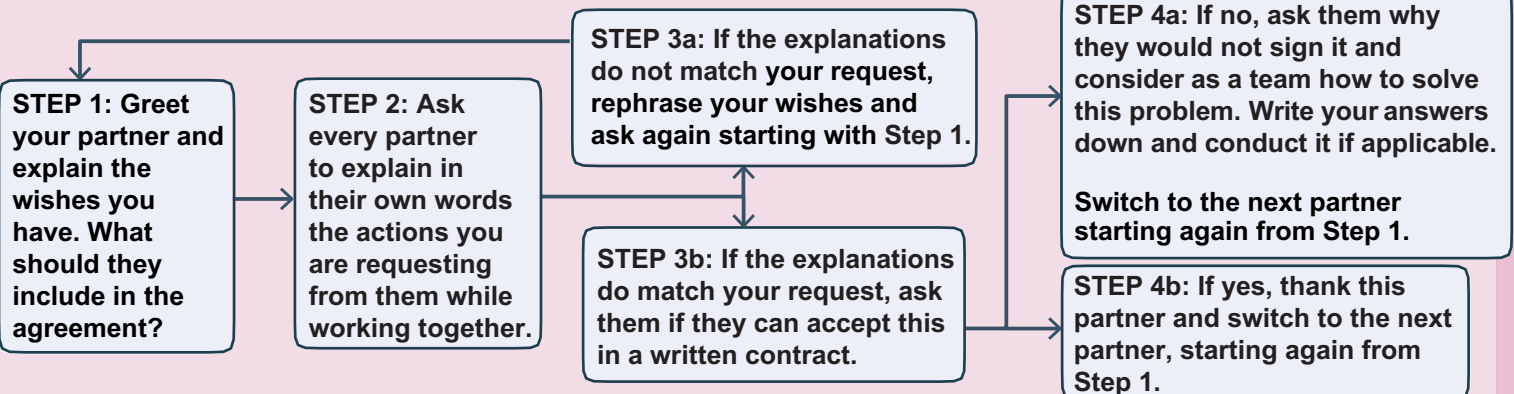
In addition, think about intellectual property rights and ownership issues for research data and publication.

When does the collaboration start? When does it end? To which code of conduct should the different partners adhere?

4 Discuss and come to an agreement:

In groups of two or three, go through the next steps:

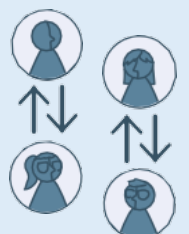
Present your request for collaborative work to each other, starting with one partner and following the instructions below:



5 Reflect on reaching an agreement:

As a class, discuss:

- What did different groups agree on, and why?
- What was challenging in the process?
- If groups could not come to an agreement, how did they proceed?
- Why is an agreement necessary in research collaborations?



M5

Researchers ensure appropriate authorship and citation! (cf. ECoC 2017, p. 7)

Description and background

This learning unit:

- Introduces (future) researchers to academic writing**
- Challenges (future) researchers to learn rules in academic writing**
- Emphasises how important honesty in academic writing is**



An advocate for research integrity

Kristina Bliznakova

Keywords

Academic writing; quotation; paraphrasing; summarising; plagiarism; misconduct; citation rules

This unit has been prepared for disciplinary learning groups.

Learning objectives

- 1 Explain the importance of citation**
- 2 Weigh criteria for good academic writing**
- 3 Prioritise appropriate academic writing**

Learning stages

- 1 Become familiar with the topic**
- 2 Dive into an interesting story**
- 3 Compare citations and prioritise appropriate academic writing**
- 4 Engage in storytelling about rules for appropriate citation**

**“Future researchers need instructions on how to correctly quote sources in order to avoid plagiarism.”
(Kristina Bliznakova, an advocate for research integrity)**



1 Become familiar with the topic:

Homework (before the unit starts) or reading session

What is plagiarism? The Glossary for Academic Integrity describes plagiarism as the presentation of works / contents / ideas from other sources without proper recognition or accurate reference to the sources (cf. Tauginienė, L et al. Glossary for Academic Integrity. ENAI Report 3G [online]: revised version, October 2018).

Find a code for academic writing for your discipline, read it and bring it with you to class. Discuss the meanings of any unknown words and contents.

2 Dive into an interesting story:

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

During a seminar, Hannah's lecturer had informed the students that their final papers would be subjected to a plagiarism test, as incidents of misconduct had been increasing. Hannah did not believe she was guilty of plagiarism, but when the lecturer mentioned correct quoting and references, as well as acknowledging important work and intellectual contribution of others, Hannah began to feel nervous. "What exactly is appropriate citation?", she wondered.

Write Ethically from Start to Finish:

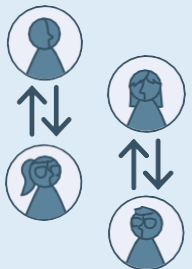
3 Compare citations and prioritise appropriate academic writing:

Hannah once heard that **40% of the content of students' submissions was taken from other sources. Take your time and think about this. Does it count as plagiarism if students refer to a text and...**

- copy word for word with no quotation marks, reference to the original source or author? yes no not sure
- copy word for word with no quotation marks, but reference to the original source and author? yes no not sure
- copy word for word with quotation marks, but no reference to the original source or author? yes no not sure
- tell statements in their own words with no quotation marks but references at the end of the paraphrased section? yes no not sure
- describe the basic idea of a piece of work in their own words with reference to the original source and author? yes no not sure
- describe the basic idea of a piece of work in their own words with no reference to the original source and author? yes no not sure

Discuss your choices in class. Why is it so important to cite correctly?

This exercise is taken in modified form from Glendinning, I (2011), adapted by Dlabolová, D; Foltýnek, T; Schäfer, A (2016): Where is the borderline between poor academic practice and plagiarism? 2018-06-21. <https://www.academicintegrity.eu/wp/all-materials>



Tips for Avoiding Plagiarism:

4 Engage in storytelling about rules for appropriate citation:

In groups of three or four, imagine you are tutoring Hannah. She has written you an email asking for tips on academic writing.

Before you answer her, discuss the specifics of your discipline:

- Which code of academic writing do you use?
- What are the most important academic writing rules?
- What citation style do you use?

How to quote directly
Use someone's text (or image, chart, table etc.) word-for-word, stating the source and original author. Indicate where the original text starts and ends by enclosing the quoted section in quotation marks. Add a reference at the end of the quote.

How to paraphrase
Take a statement, idea or text of somebody else and tell it in your own words. Acknowledge the original source by using a reference at the end of the paraphrased section.

How to summarise
Describe the basic idea of a piece of work in your own words. State the original source of the summarised ideas.

European Code of Conduct for Research Integrity

Pick one important sentence from the European Code of Conduct for Research Integrity and quote it correctly.
Use this example in your email to Hannah to exemplify which academic writing rules are important.

Let each group member check the email, and especially the quote.
If you all agree that the email you have written is both informative and correct, send it to Hannah@path2integrity.uni-kiel.de (voluntary task).



Researchers, research institutions and organisations ensure access to data is as open as possible and as closed as necessary.
(cf. ECoC 2017, p. 6)

Description and background

This learning unit:

- Introduces (future) researchers to norms of proper data management*
- Builds the competency to explain and justify proper data management*
- Challenges (future) researchers to choose practices that respects the rights of others as well as support their own work*
- Emphasises the principles of findable, accessible, interoperable and re-usable (FAIR) data while describing their limitations*

This unit has been prepared for disciplinary learning groups.



An advocate for research integrity

Tymon Zieliński

Keywords

Data management; FAIR; open science; informed consent

Learning objectives

- 1 Be open, unbiased and accepting of ambiguity*
- 2 Explain and justify arguments for proper data management*
- 3 Compare and prioritise different handlings of proper data management*
- 4 Be ready to choose norms together with the dialogue group and for your target group*

Learning stages

- 1 Become familiar with the topic*
- 2 Choose an interesting challenge*
- 3 Engage in role play*
- 4 Explain and justify data management*
- 5 Evaluate different arguments, face dissent and achieve consensus*

“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)





1 Become familiar with the topic:

Homework (before the unit starts) or reading session

Read chapter 2.5 of “The European Code of Conduct for Research Integrity” and

Wilkinson M, Dumontier M, Aalbersberg I, Appleton G, Axton M, Baak A, ..., Mons B (2016): The FAIR Guiding Principles for scientific data management and stewardship. In: *Scientific Data*, 3:160018. <https://doi.org/10.1038/sdata.2016.18>

FAIR Principles:

Research data and related meta-data should be findable, accessible, interoperable and re-usable (FAIR), unless legal obligations dictate otherwise. Research data are the data on which findings and arguments are based. Meta-data are data describing other data.

GoFAIR Website: www.go-fair.org



2 Choose an interesting challenge:

A researcher has come across an interesting journal article that is underpinned by data that could be relevant for her own new research project. According to a statement at the end of the article, “The datasets generated and analysed during the current study are available from the corresponding author on reasonable request.”

She decides to contact the corresponding author to request access to the data, outlining how she plans to use them. As her research project has just started, some questions are still open and will only be settled once the project has progressed further. A few days later she receives this reply: “Unfortunately I cannot follow your request. Because you cannot specify precisely what you will do with the data, the request is unfounded and, therefore, unreasonable.” This answer leaves the researcher wondering: “What then is a reasonable request? Of course, I cannot tell in every detail what I will do with the data, what insights the analysis might generate and so on. Research is open-ended and risky, after all.”

If this challenge is relevant to your discipline, you can use it in the following exercise. If not, please select an equivalent challenge from your discipline. Equivalent challenges may, inter alia, relate to questions on where to store data, how to describe data, whether or not to retain data, whether or not to make data publicly accessible, or choosing meta-data standards and file-formats. The selected challenges should clearly relate to the FAIR principles.



3 Engage in role play:

Go through the next steps in groups of four to six people:

Flesh out your challenge with details

Imagine a conflict happens between different parties in which the FAIR principles can be invoked.

Perform the challenge in a roleplay.

Describe the conflict and write it down (each group member needs a text version).

4 Explain and justify data management:

Reflect alone and answer the following questions:

Which rules do the parties implicitly reference in your conflict?

Did the parties explain the rules in the role-play?

If not, can you imagine which rules justify the actions of each of the two parties?

Which rules conflict? Which rule(s) should take precedence? Why?

5 Evaluate different arguments, face dissent and achieve consensus:

Discuss in class, why you have decided to award priority to the rule you have chosen to follow.

Explain why you disagree with alternative courses of action.

Is it because you disagree with other rules or because you have ranked the rules according to their relative importance?





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.

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



An advocate for research integrity

Anna Wójcicka

Keywords

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

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)





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.

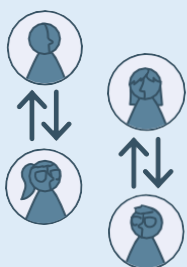
Everybody picks somebody's value from the wall. Describe this value to your class by giving an example of various actions conducted by a researcher who embodies this value. Let the individuals who wrote down the values add any examples of researchers' actions, if they want.

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!



Path  Integrity

Handbook for Teachers and Trainers

*Integrity in Research
and Society*

S-Series



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Subject to change

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 your students how to do research, as well as help them understand how important reliable research is for society? This handbook accompanies the **Path2Integrity learning cards (P2ILC)** on five topics (<https://www.path2integrity.eu/ri-materials>) and introduces you to an easy and fun learning programme that has been evaluated in over 25 training sessions. The Path2Integrity learning cards S-series is especially designed for secondary school students and undergraduates. Through this series, students learn how research results must be produced in order to be reliable and thus useful for society.

The S-series learning cards help students use research findings responsibly while understanding the research landscape and processes within it, and by appreciating the importance of research integrity's criteria for society (cf. Häberlein 2020, 6f.). With the aid of many experienced teachers and trainers, the authors collected tips in this handbook on how to prepare each card, how to support your students' learning curve, and how to overcome the various challenges that might arise as you bring this important topic to your students.

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).

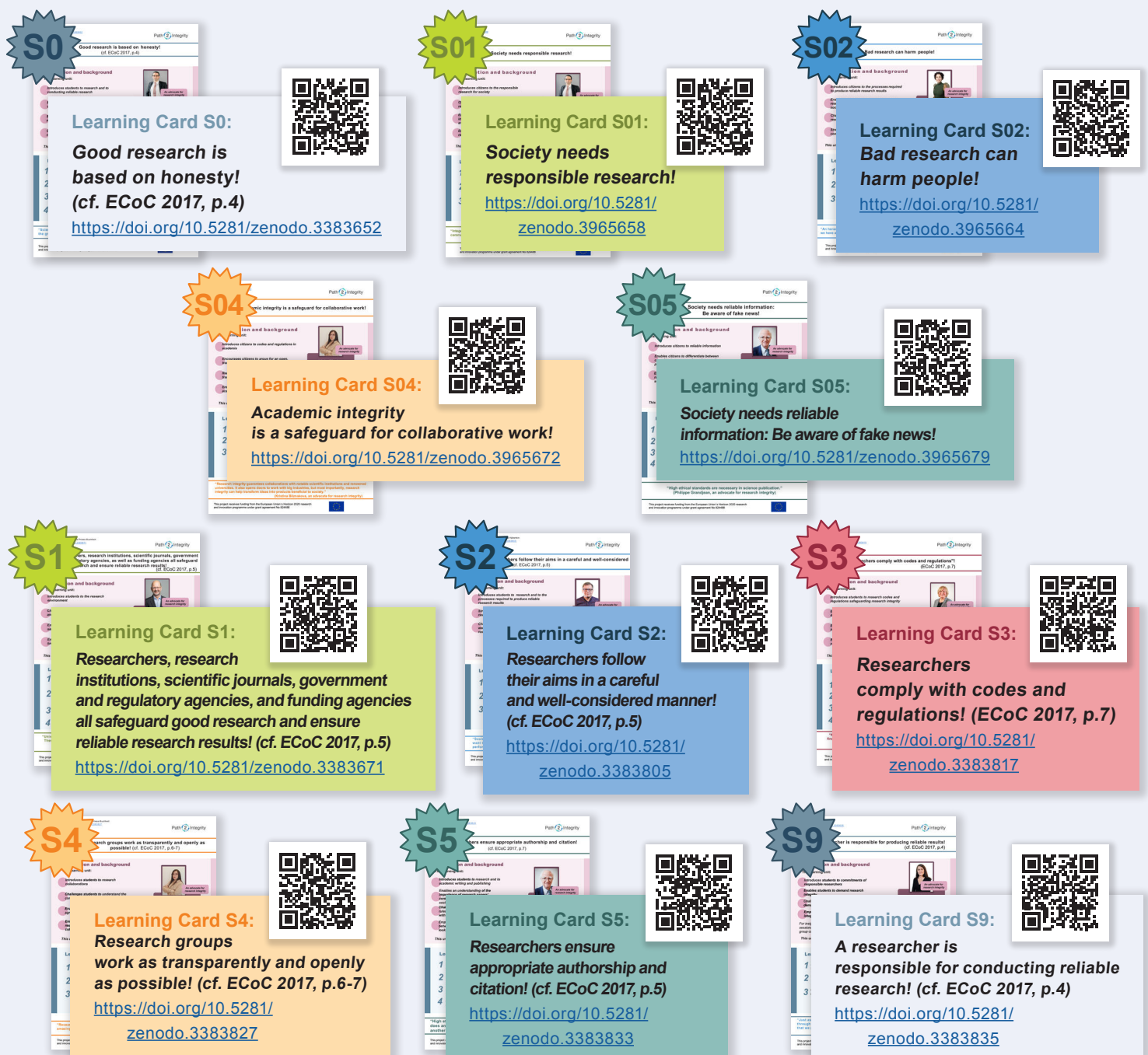


Figure 1: The Path2Integrity S-series learning cards

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 class. Furthermore, the length of the exercises and sessions can be adapted to meet the particular needs of your class; 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).

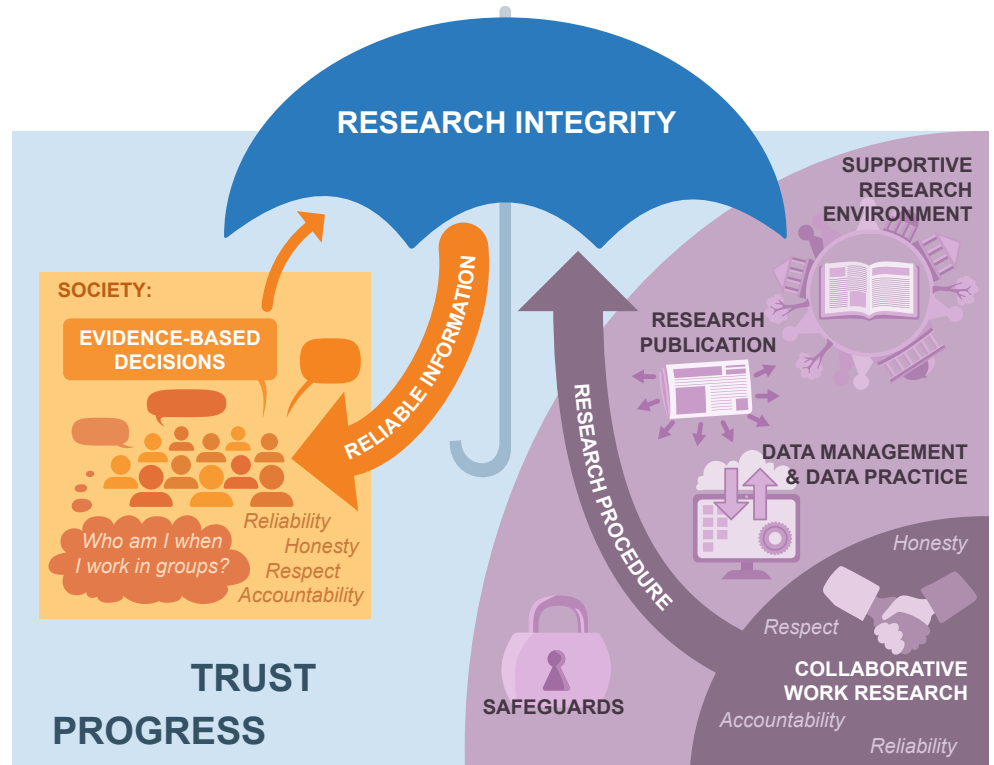


Figure 2: Integrity in research and society

backgrounds. The following chapters show you how to foster your students' understanding of good research practice and its importance to society by using the Path2Integrity learning cards from the S-series. If you are interested in material prepared for graduates or post-graduates, switch to the handbook for the M-series for disciplinary settings or the Y-series for interdisciplinary settings.

“I introduced my students to the topic of good research practice when I used the cards in a course for bachelor students of electronic engineering in 2019. They didn't know anything about responsible research at first. But they immediately understood the connection by looking at our knowledge-based society. I showed them how they themselves rely on the results of research in many ways, both in everyday life as well as in their studies; they realised that we as a society have to demand that the research community follow certain principles that guarantee reliable research results.

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 your students to develop their own standpoint based on sound arguments, and to be able to demand integrity in research and society.

“The design of the cards and the step-by-step procedure especially motivated my students when I used four learning cards from the S-series last semester. They also liked the active exercises, and found these exciting and engaging. In the session “Good research is based on honesty!”, however, they found it difficult to relate the scenario to their everyday lives and studies. I realised that they did not yet define themselves as researchers or as decision-makers. To open the door for them to integrity in research and society, I outlined the exercises from the sheet in detail and made reference to the students' prior experience in my explanations in order to help them relate to the topic. I assisted them whenever questions arose; that has helped a great deal.

As a cornerstone of the Path2Integrity learning card programme, students “[...]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 students' cultural and religious

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

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: *What happened at LONA Science Centre?*;
3. be familiar with a code of conduct for research integrity; and
4. have a plan how to navigate your group through the card.

Figure 4: Path2Integrity learning card first page

“When I started using the P2I learning cards in November 2019, I 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 S-series (https://www.youtube.com/watch?v=79Z_n-z5i5U, Fig 3) 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.



Figure 3: QR code link to the introductory video of the P2I S-series learning cards

What I like about the programme is the wide range of topics and the **flipped-classroom** style with reading preparations, in which my students were 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 students, my only task was to inform them what to read. In just three minutes, I had sent my students 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 “Research groups work as transparently and openly as possible!” and started to prepare myself with the help of the second page. I worked it through, thought about how I could lead my students through the card’s various exercises and tasks using their specific knowledge and

habits, and made a copy of the second page for each student.

Because my students often feel inhibited in situations in which they worry they will be laughed at, I concentrated on preparing the second and third tasks of the card. I decided to prepare a sort of bridge to ease them into a good working mood. Using staples and tape, I designed an avantgarde – well, okay, ugly – stick figure, which I showed my students right at the start of task two. It worked! Ms Stick Figure sparked some smiles and helped get my students into a creative mood.

The session was a complete success! In class we introduced ourselves to Emma, Rebecca and Prof Weis at LONA Science Centre, and performed an engaging storytelling exercise about reluctant behaviours that emerge during cooperation. Using the card, we practiced and overcame disagreements and disrespectful accusations by establishing a strong collaborative base. I enjoyed how much fun we had, and continued using the cards in future classes.

After the third session, my students 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 students were to exchange their thoughts and arguments.

How to help students 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 students to study learning material at home, I carefully selected and prepared the material to avoid overloading them. I wanted my students to engage with the subject without losing motivation². It’s great that the P2ILC already contain material that I could supplement with guiding questions. I’m lucky that my students are used to doing some learning at home, meaning we had more time for the interactive sessions in class.

II. You can introduce Emma’s chat: What happened at LONA Science Centre?

Emma’s chat (*What happened at LONA Science Centre?*) is a narrative from the Path2Integrity learning card programme, in which reliable research results are at stake. The narrative is introduced in S0 and subsequently used in each card while developing in different directions.

“The story of Emma, Rebecca and Prof Weis at LONA Science Centre, which is used in many of the cards, fascinated us. From session to session, students identified with the characters and imagined as well as relived their adventures. In particular, my students loved the pink sections of the learning cards, which emphasise taking a dialogical approach to the LONA Science Centre narrative.

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 student 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 “Eleven sessions on integrity in research and society” on page 11 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 roadmap (<https://www.path2integrity.eu/teaching-RI> Fig. 5).

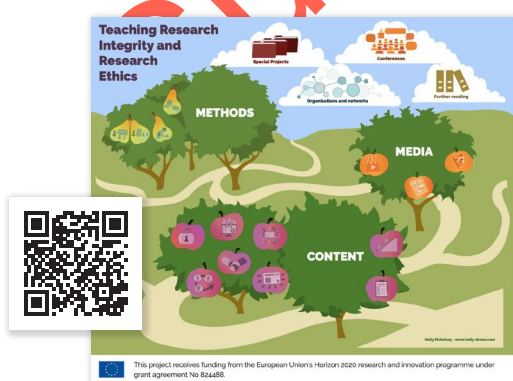


Figure 5: Path2Integrity roadmap

With *What happened at LONA Science Centre?*, you can reflect as well as

express different points of view and start a reciprocal learning process. If you want, you can either use the visually appealing graphic (<http://doi.org/10.5281/zenodo.3384744>) or the video (<https://www.youtube.com/watch?v=e4-TbZIMvto>) at the beginning of each session. To ensure that your students 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: Emma’s chat: What happened at LONA Science Centre? (graphic and video)

2 For further information see Nimmerfroh 2016.

“When we reviewed what Emma’s chat entailed, my students noticed that Emma had overheard an argument in which different motivations are involved. For my students, it was evident that the story displayed a clash between Prof. Weis’ obedience towards the head of the institution and her inclination towards good scientific practice. 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 S4, my students listened to different statements from their peers, outlined their knowledge, and started to discuss power structures in the context of Emma’s chat. They began to develop and rationalise their own arguments for the importance of integrity in research and society.

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, students 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

as a symbol of discord in research cooperation. 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.



“When I asked my students to write a scene from the script of a screenplay in our S1 session, they got really into it, bringing in reliable research results and facts, as well as opinions and judgements as to how this might compare to real-life conditions⁶. At one point, I intervened and pointed out that ‘What happened at LONA Science Centre?’ is a fictional narrative that can develop in different ways. Students enjoyed looking for alternative solutions and justifying their decisions to one another. Working in small groups, they found themselves at the centre of a process in which both interaction and problem-solving skills were required.

I’m a fan of encouraging discussion in the class-room. Still, I did moderate controversy in the students’ discussions to prevent emotions flaring. I wanted to keep the balance between what Retzmann, an economics education expert, calls “involvement and distance”⁷ and decided to provide my students with decision matrixes to help them clarify the advantages, disadvantages and consequences of alternative decision options. It’s great that the learning cards allow you to be so flexible.

Figure 7: Storytelling

In the storytelling exercises contained in the P2ILC, students 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 the importance of citation methods, difficult working conditions that lead to research guidelines being disregarded, or the use of a raised voice

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.
 6 cf. Kaiser and Brettschneider 2015, 146f.
 7 Retzmann 2007, 43 quote Reinhard 1999, 10ff. [translated by Lisa Häberlein].

IV. You can promote role play

Role-playing is an exploratory game in which students assume an “as-if character”.⁸ 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.⁹



Figure 8: Role play

“It is this experience of putting oneself into different roles that helped my students develop a deeper understanding of their own and others’ positions, and to engage questionable research results and possible solutions 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 making sure that my students engaged with the learning content of learning card S3 “Researchers comply with codes and regulations” in a thoughtful manner. 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 students to spend some time discussing the screenplay. I asked them to imagine themselves as researchers in a team in which misconduct is suspected. How would they react? What are the consequences? Why would this or that action be good or bad for science and society? We discussed which action should be referred to as good scientific practice or misconduct. This allowed my students to delve into the scenario more deeply. We tried the role play once again and it worked much better.

8 Fürstenau 2015, 106 [translated by Lisa Häberlein].

9 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; Strohmets 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 students best.** Get them in the right mood thematically and emotionally. Read the instructions together and help your students 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.¹⁰
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 students out of the scenario by allowing them to summarise and evaluate what they have experienced¹¹. 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 students 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.

10 cf. Fürstenau 2015, 96.

11 cf. Fürstenau 2015, 104.

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, students 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 students 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 (S0 and S9). 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/714871?newtest=Y&lang=en>



Post-test:
<https://path2integrity.eu/limesurvey/index.php/714871?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 class and examines in open and closed questions (1) how to act as a researcher, e.g. how to cite 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 students' 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 S9, 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.¹²

The P2I project recommends starting with S0 and ending your teaching with S9 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 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 students will engage in storytelling, role-playing or reaching an agreement. In these sections, students 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, students 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 students 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

12 cf. Wilder et al. 2020, 15.

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 students are not used to actively contributing, trainers can facilitate a smooth transition into the exercise by allowing the students to choose between being an observer or player during the dialogical exercises, thus giving students 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 students to take a new direction¹³:

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.
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 convince 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 S5:
 - a) **understand academic writing procedures;**
 - b) **describe criteria for good academic writing;**
 - c) **explain the importance of citation;**
 - d) **weigh different evaluation criteria you can use when writing academic or non-academic papers such as fiction.**

13 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 students 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 [...]”¹⁴ 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”¹⁵ 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.

14 Prieß-Buchheit et al. 2020, 20.

15 Prieß-Buchheit et al. 2020, 20.

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 students with the writing prompt at the end of the session and decide when they need to return their response.

Eleven sessions on integrity in research and society

S0



Learning Card S0:
Good research is based on honesty! (cf. ECoC 2017, p.4)
<https://doi.org/10.5281/zenodo.3383652>



Links from learning card S0:

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



This learning card **introduces** learners 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 five learning steps, students learn basic values that characterise good research, formulate reasons for honest research by telling stories and find arguments for trustworthy research results for science and society. **This learning card is best used to start the Path2Integrity learning card 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.

Figure 11: S0 learning card

S01



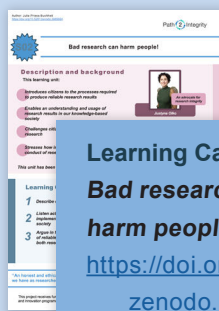
**Learning Card S01:
Society needs
responsible research!**
[https://doi.org/10.5281/
zenodo.3965658](https://doi.org/10.5281/zenodo.3965658)

“Students in my course needed precise instructions for the storytelling exercise. They wanted to know, for example, how many words to write for their stories. I supplied them with these details and they were happy to do the task. Sometimes it just takes a little support.”

This learning card challenges citizens to value responsible research results used in society. In five exercises, they learn to accept researcher’s impact for society, acknowledge the importance of reliable research results and request that researchers conduct responsible research.

Figure 12: S01 learning card

S02



**Learning Card S02:
Bad research can
harm people!**
[https://doi.org/10.5281/
zenodo.3965664](https://doi.org/10.5281/zenodo.3965664)

In this learning card, citizens become storytellers and speak up for responsible research. They describe criteria for bad research, learn how to implement research outputs into our knowledge-based society and argue in favour of the importance of reliable research results for both research and society in four learning steps.

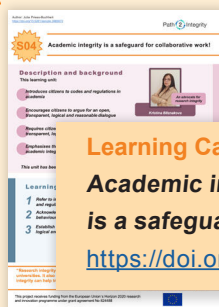
Links from learning card S02:

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



Figure 13: S02 learning card

S04



**Learning Card S04:
Academic integrity
is a safeguard for collaborative work!**
<https://doi.org/10.5281/zenodo.3965672>

Links from learning card S04:

Building a foundation: https://www.path2integrity.eu/teaching-RI/content/collaborative_work

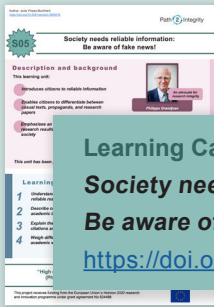


This learning unit introduces citizens to codes and regulations in academia which are important for group work. In rotatory role play they establish an open, transparent, logical and reasonable dialogue and acknowledge that aggressive behaviour hinders academic integrity.

“International students reported that they actually experience similar situations in their everyday life as addressed in the learning card S04, so we chose one of these examples for discussing academic integrity in collaborations; it was great and has allowed for the exchange of experience and knowledge!”

Figure 14: S04 learning card

S05



Learning Card S05:
**Society needs reliable information:
Be aware of fake news!**
<https://doi.org/10.5281/zenodo.3965679>

This learning card introduces citizens to reliable information in our knowledge-based society. In storytelling, they understand the importance of reliable research results and describe criteria for reliable academic information. In five learning steps, participants explain the importance of correct citations and reliable sources and weigh different criteria for academic writing.

Figure 15: S05 learning card

S1



Learning Card S1:
Researchers, research institutions, scientific journals, government and regulatory agencies, and funding agencies all safeguard good research and ensure reliable research results! (cf. ECoC 2017, p.5)
<https://doi.org/10.5281/zenodo.3383671>

Links from learning card S1:

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 class, you can also use the following additional material:

The Research Integrity Office (ORI) provides an infographic on "The research community safeguards" addressing the responsibility of the research community in promoting research integrity: https://ori.hhs.gov/sites/default/files/2018-04/3_Should_You_Trust_Science.pdf



This learning card draws learners' attention to the research environment that ensures reliable research results for society. The exercise sheet enables participants to acknowledge safekeepers in research and challenges them to value and request good and reliable research for society. In five steps the learners engage in storytelling and reflect on how to require researchers to adhere to the norms of honest research.

“ Before I assigned students to do the preparation task from S1, I introduced them to the terms ‘ethics commission’, ‘ombuds-person’ and ‘data management officer’ using the definitions in the yellow highlighted box from the learning card. This was a good move, because my students were not yet familiar with the idea of a ‘research environment’. For example, they had no idea that a noteworthy regulatory institution exists that contributes to securing reliable research.

Figure 16: S1 learning card

S2



Learning Card S2:
Researchers follow their aims in a careful and well-considered manner! (cf. ECoC 2017, p.5)
<https://doi.org/10.5281/zenodo.3383805>



This learning card introduces learners to research procedures that are necessary for careful and well-considered research and for producing reliable results. The exercises stress how important the responsible conduct of research is for society. In four learning steps, students describe the criteria of responsible research and, when telling stories, argue in favour of the importance of reliable research results for both science and society.

“When I asked my students to continue the story of the LONA Science Centre and give advice to Prof. Weis in my S2 session, we took another look at the norms and values mentioned in the ECoC. Where they could only think of one solution at a time, the document provided us with alternative arguments. Heterogeneity really improved multidimensional thinking in my class.

Figure 17: S2 learning card

Links from learning card S2:

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 class, you can also use the following additional material:

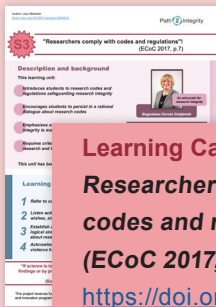
The science comic from digital architect Patrick Hochstenbach “Anatomy of scientific bias” illustrates clear messages regarding norms in research procedures. https://hochstenbach.files.wordpress.com/2017/02/scientific_bias_600dpi_rgb.jpg?w=710



“What is scientific research?” is a 3-minute video that gives students a brief introduction to research procedures. You can ask students to watch the video and take notes: Which procedures might follow George’s experiment before he actually gets to the final product? <https://www.youtube.com/watch?v=RyLsKM3lkrA>



S3



Learning Card S3:
Researchers comply with codes and regulations! (ECoC 2017, p.7)
<https://doi.org/10.5281/zenodo.3383817>



This learning card introduces learners to guidelines safeguarding research integrity and requires them to learn criteria for promoting good research and engaging in dialogue surrounding it. In five learning steps, role players are asked to take account of regulations that help maintain good research, to enable reliable research results by establishing an open, transparent, logical and reasonable dialogue and to acknowledge that structural aggression hinders good research.

“When I used learning card S3, I changed the lesson plan and introduced my students to German rules and regulations safeguarding good research practice first. Before we started role-playing, I pointed out what it means to be tolerant in the case of ambiguity, to communicate openly, to listen actively and to trust one another. Together we practiced how to provide rational arguments and how to weigh the pros and cons of different actions. That was a good idea, because my students had initially not known anything about the German code of conduct or about how to conduct a dialogue.

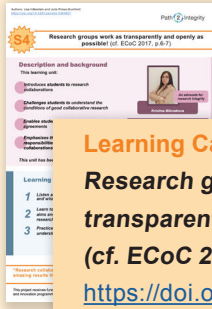
Links from learning card S3:

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>



Figure 18: S3 learning card

S4



Learning Card S4:
Research groups work as transparently and openly as possible!
(cf. ECoC 2017, p.6-7)
<https://doi.org/10.5281/zenodo.3383827>

This learning card introduces learners to research collaborations and corresponding principles. In five learning steps, students learn what collaborations are and why it's necessary to be able to reach an agreement. Students act as if they are researchers, express their wishes and needs through storytelling and practice mutual understanding and respect in a dialogue.

Links from learning card S4:

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>

Collaborative Research Solutions: <https://www.youtube.com/watch?v=NTtAeiWKGDs>

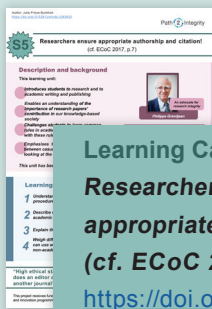
Building a Foundation: https://www.path2integrity.eu/teaching-RI/content/collaborative_work



“I explained research agreements by linking them to open and transparent communication. That went well, because my students overcame their initial assumption that group work is just talking to one another. They started to think about group work from a new angle and discovered that transparency and openness are preconditions for good research collaborations.

Figure 19: S4 learning card

S5



Learning Card S5:
Researchers ensure appropriate authorship and citation!
(cf. ECoC 2017, p.7)
<https://doi.org/10.5281/zenodo.3383833>

“When we worked on the S5 card together, focusing on correct authorship and citation, my students started to ask questions about their seminar papers and final theses. So, I took this opportunity to encourage individual questions on scientific writing.

Links from the learning card S5:

The three minute video “Refairence” on correct citation for the prevention of plagiarism: https://www.kim.uni-konstanz.de/typo3temp/secure_downloads/68748/0/d217e531e6405cdc07605d5f264c03a7addc0a4f/film_zitieren_engl.mp4



This learning card covers the topic of scientific writing and authorship and introduces learners to the rules of academic papers in five learning steps. Through storytelling, students develop an understanding of which processes have to be taken into account when writing academic papers, and learn to name various criteria for good scientific writing as well as explain the importance of citing sources. They also learn to be able to distinguish academic papers from non-academic papers.

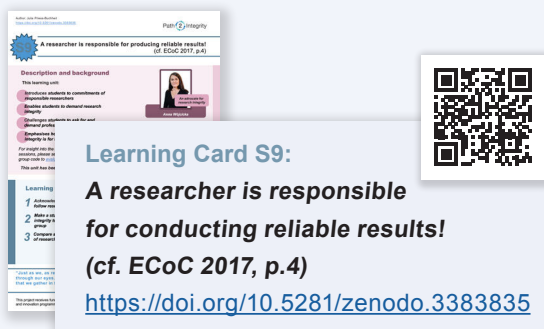
If it works for your class, you can also use the following additional material:

The science comic from the digital architect Patrick Hochstenbach “Plagiarism” illustrates clear messages regarding research values in scientific writing: https://hochstenbach.files.wordpress.com/2017/02/plagiarism_600dpi_rgb.jpg?w=710



Figure 20: S5 learning card

S9



Links from learning card S9:

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



“ 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.

With this learning card, students reflect on the importance of reliable research results for science and society. In four learning steps, they recognise codes and regulations as an obligation to good scientific practice, require researchers to commit themselves to the such 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 S-series. With the post-test and the request in learning card S9 to send an email to evaluation@path2integrity.uni-kiel.de, you will be able to gain insight into your students' improvement.

Figure 21: S9 learning card

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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.3383652> learning card S0

<https://doi.org/10.5281/zenodo.3965658> learning card S01

<https://doi.org/10.5281/zenodo.3965664> learning card S02

<https://doi.org/10.5281/zenodo.3965672> learning card S04

<https://doi.org/10.5281/zenodo.3965679> learning card S05

<https://doi.org/10.5281/zenodo.3383671> learning card S1

<https://doi.org/10.5281/zenodo.3383805> learning card S2

<https://doi.org/10.5281/zenodo.3383817> learning card S3

<https://doi.org/10.5281/zenodo.3383827> learning card S4

<https://doi.org/10.5281/zenodo.3383833> learning card S5

<https://doi.org/10.5281/zenodo.3383835> learning card S9

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

https://www.youtube.com/watch?v=79Z_n-z5i5U An introduction video for the use of the Path2Integrity S-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

<http://doi.org/10.5281/zenodo.3384744> Graphic: Emma's Chat: What happened at LONA Science Centre?

<https://www.youtube.com/watch?v=e4-TbZIMvto> Video: Emma's Chat: What happened at LONA Science Centre?

<https://path2integrity.eu/limesurvey/index.php/714871?newtest=Y&lang=en> Pre-test to evaluate learning units

<https://path2integrity.eu/limesurvey/index.php/714871?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://path2integrity.eu/limesurvey/index.php/593973?lang=en> Assessing the trainers' perspective

<https://path2integrity.eu/limesurvey/index.php/553522?lang=en> Assessing the participants' experience

<https://learning-p2i.eu/> P2I online teaching platform

<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://ori.hhs.gov/sites/default/files/2018-04/3_Should_You_Trust_Science.pdf Infographic on "The research community safeguards"

https://hochstenbach.files.wordpress.com/2017/02/scientific_bias_600dpi_rgb.jpg?w=710 Science comic: "Anatomy of scientific bias"

<https://www.youtube.com/watch?v=RyLsKM3lkrA> Video: "What is scientific research?"

<https://www.youtube.com/watch?v=NTtAeiWKgDs> Video: „Collaborative Research Solutions“

https://www.path2integrity.eu/teaching-RI/content/collaborative_work P2I comic: "Building a Foundation"

https://www.kim.uni-konstanz.de/typo3temp/secure_downloads/68748/0/d217e531e6405cdc07605d5f264c03a7addc0a4f/film_zitieren_engl.mp4 Video: "Refairence"

https://hochstenbach.files.wordpress.com/2017/02/plagiarism_600dpi_rgb.jpg?w=710 Science comic: "Plagiarism"





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

Description and background

This learning unit:

- Introduces students to research and to conducting research reliably*
- Emphasises how important responsible conduct of research is for society*
- Stresses the importance of reliable research results in our knowledge-based society*
- Challenges students to demand compliance in research principles*

Please ensure to obtain informed parental consent and informed assent from participants if required in your country or in your institution.

This unit has been prepared for non-disciplinary learning groups.



An advocate for research integrity

Alexander Gerber

Keywords

Good research practice; reliable research results; research integrity; honesty; reliability; accountability; respect in research

Learning objectives

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

Learning stages

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

**“Science has received a mandate from society to produce knowledge and thus address the grand challenges of our time.”
(Alexander Gerber, an advocate for research integrity)**



S0 Path Integrity



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/714871?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:

As a class, discuss how sure and unsure you were in your survey answers. In what way(s) do you think the cases from the survey can be of importance to you? After this questionnaire, what is your first idea of good research? Have a brainstorming session together.

3 Dive into an interesting story:

Learn more about good research practice and look up the story from LONA Science Centre (video or text). What happened in this story? What went wrong?

4 Connect the example to your life:

Take a minute for yourselves to 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 for.

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 to your partner. In favour of what did your characters argue and how did they use research results to strengthen their arguments? Explain whether this person is a researcher or whether they work in some other area of society.

Imagine the worst. In a co-creative process with your partner, choose one of your characters and imagine a story in which the research results turn out to be fraudulent because the researcher who produced them had cheated. The story should include both the cheating researcher and your character. Include a person and/or a part of society that gets hurt due to the fraudulent results. Write down your storyline in bullet points.

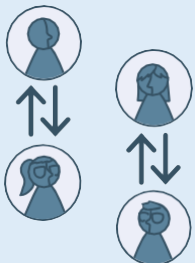
Turn it to the best. Now rewrite your story! Together, imagine that another researcher has stopped the cheating. Describe in detail what values this reliable researcher has and how your character is now able to use these reliable research results for their argument. Write down a short story in which a person and/or a group is able to advance because of the reliable results and the argument in favour of it.

Read some of these stories aloud!

6 Reflect on reasons for reliable research in society:

As a class, collect reasons to conduct reliable research on a chalk board or flip chart. Discuss why it is important that researchers follow rules such as that good research is based on honesty.

Mark four significant reasons from your collection as to why researchers need to follow these principles. Write them in your notebook.



S01

Society needs responsible research!

Description and background

This learning unit:

- Introduces citizens to responsible research*
- Challenges citizens to value responsible research results used in society*
- Enables citizens to realise how important good research and reliable results are*
- Emphasises that research integrity safeguards research for society*



An advocate for research integrity

Alexander Gerber

Keywords

Research and society; responsible research; reliable research results; research principles; researchers' impact

This unit has been prepared for non-disciplinary learning groups.

Learning objectives

- 1** *Identify and accept researchers' impact on society*
- 2** *Realise the importance of responsible research*
- 3** *Request that researchers conduct responsible research*

Learning stages

- 1** *Become familiar with the topic*
- 2** *Dive into an interesting story*
- 3** *Engage in storytelling*
- 4** *Put the pieces together*
- 5** *Reflect on rules for researchers*

“Scientists with integrity reflect on why they actually do science – be it in medicine or mechanics, in communication or cultural studies.”

(Alexander Gerber, an advocate for research integrity)



1 Become familiar with the topic:

Homework (before the unit starts)

Learn more about how research affects your everyday life. Identify three examples of how research findings affect your life and prepare to present them in class.



2 Dive into an interesting story:

Review or look up the story from LONA Science Centre (video or text).

Briefly repeat the story and flesh out who is attentive, respectful, open, responsible, motivated, impartial etc.

3 Engage in storytelling:

Come together in groups of three to four persons. Write a scene of a play in which Emma, David and Rebecca meet their mayor and the head of the fire brigade one day after their visit to the LONA Science Centre.

Discuss the following topics before you start writing:

1. Who are the actors in your play?
2. What do they think about bad research, and why?
3. Who could request the researchers from LONA Science Centre to conduct research responsibly? How could s/he do that?

Your scene should include a dialogue about good research. By putting honesty, respect, reliability and accountability first, your actors should link their dialogue to the happenings at LONA Science Centre. Write your scene.

Read all of your stories aloud!



Society needs researchers with research integrity

Researchers with research integrity are able to explain step by step how they arrived at their research results. Society can rely on their developments and results.

“It is of crucial importance that researchers master the knowledge, methodologies and ethical practices associated with their field. Failing to follow good research practices violates professional responsibilities. It damages the research processes, degrades relationships among researchers, undermines trust in and the credibility of research, wastes resources and may expose research subjects, users, society or the environment to unnecessary harm.”

(ECoC 2017, p. 8)

4 Put the pieces together:

Come together in class.

Collect why citizens should request responsible research from academia. Decide together how citizens can request researchers to conduct responsible research and write it into your notebook.

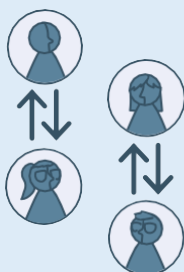
5 Reflect on rules for researchers:

Return to your stories with the groups you were working in earlier. Imagine that other students will watch your scene. Decide together which actions your fellow students should learn through your scene.

For society, researchers should _____.

For society, researchers should _____.

Citizens should request _____.





Bad research can harm people!

Description and background

This learning unit:

Introduces citizens to the processes required to produce reliable research results

Enables an understanding and usage of research results in our knowledge-based society

Challenges citizens to speak up for responsible research

Stresses how important the responsible conduct of research is for society



An advocate for research integrity

Justyna Olko

Keywords

Research processes; reliable research results; bad research; progress in society; research output

This unit has been prepared for non-disciplinary learning groups.

Learning objectives

- 1** *Describe criteria for bad research*
- 2** *Listen actively to how research outputs can be implemented in society*
- 3** *Argue in favour of the importance of reliable research results for both research and society*

Learning stages

- 1** *Become familiar with the topic*
- 2** *Dive into an interesting story*
- 3** *Engage in storytelling*
- 4** *Collect arguments in favour of responsible research*

**“We as researchers have the responsibility towards society to conduct research in an honest and ethical way.”
(Justyna Olko, an advocate for research integrity)**





1 Become familiar with the topic:

Homework (before the unit starts) or reading session

Look up three stories about research fraud. Bring them to class.

Read chapters 1 and 3.1 of “The European Code of Conduct for Research Integrity”.

Discuss what is written in the document and the meanings of any unknown words.

**European Code
of Conduct for
Research Integrity:**



2 Dive into an interesting story:

Review or look up the story from LONA Science Centre (video or text).

Briefly flesh out what characteristics the students (Emma, Rebecca and David) and two researchers (Prof. Weis and her colleague) have.



3 Engage in storytelling:

Now imagine the story continues as follows. Let one read aloud:

“No!”, Prof. Weis cried out. “This couldn’t be true.” According to the newspaper article in her hand two firefighters died in a storm the day before. The head of the fire brigade stated that three more were severely injured because they overlooked the retreat signals, which were implemented in their trainings due to the results of a study she co-authored last year. Prof. Weis could not ignore it any longer. The past caught up with her. She had falsified data in the study about reaction times in stressful situations.

Build groups of three to four persons and write a story about Prof. Weis committing fraud and its impact to society. Fill the story with sentences that argue in favour of good research procedures and underline them in colour.



What is research for society?

Progress is often driven by research. Think of space travel, penicillin, de-escalation strategies, smart homes etc.

Research is a quest for knowledge that is conducted in a way that is systematic, well-considered, well planned, thought out in advance etc.

Tax money is used to fund research and foster scientific innovations in order to improve life.

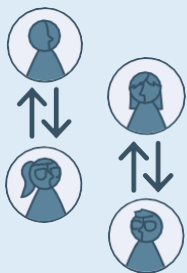
4 Collect arguments in favour of responsible research:

Come together in pairs and ask each other the following questions:

1. Why is it important that researchers, such as Prof. Weis, publish honest research results?
2. How can the head of the fire brigade argue that research should be taken seriously?

Collect the answers on a chalk board.

Tell your partner a story in which Prof. Weis this time follows values and norms of careful and well-considered research.



S04

Academic integrity is a safeguard for collaborative work!

Description and background

This learning unit:

Introduces citizens to codes and regulations in academia

Encourages citizens to argue for an open, transparent, logical and reasonable dialogue

Requires citizens to persist in an open, transparent, logical and reasonable dialogue

Emphasises that aggressive behaviour hinders academic integrity



An advocate for research integrity

Kristina Bliznakova

Keywords

Academic integrity; implicit and explicit codes and regulations; reliability in group work

This unit has been prepared for non-disciplinary learning groups.

Learning objectives

- 1** *Refer to implicit and explicit codes and regulations*
- 2** *Realise that fraudulent behaviour hinders academic work*
- 3** *Establish an open, transparent, logical and reasonable dialogue*

Learning stages

- 1** *Become familiar with the topic*
- 2** *Dive into an interesting story*
- 3** *Engage in rotatory role play*
- 4** *Discuss academic integrity*
- 5** *Establish guidelines for future work groups*

“Research integrity guarantees collaborations with notable scientific institutions and renowned universities. It also opens doors to work with big industries, but most importantly, research integrity can help transform ideas into products beneficial to society.”

(Kristina Bliznakova, an advocate for research integrity)





1 Become familiar with the topic:

Homework (before the unit starts) or reading session

Look up the comic “Building a Foundation”.

Building a
Foundation
(Path2Integrity):



2 Dive into an interesting story:

Review or look up the story from LONA Science Centre (video or text).

In your opinion, how do Emma, David and Rebecca assess the work between Prof. Weis and her colleague?

What challenges does Prof. Weis have in her team?

3 Engage in rotatory role play:

Build groups of three people.

Put all the tables and chairs aside and spread out in the room. Now expand a dialogue between the following three characters.

Character descriptions:

Emma: open and transparent, persists in excellence

David: distracted, tries to find his way

Rebecca: self-confident, works as little as possible

Situation:

Emma, David and Rebecca are back in school working on a group assignment for another class to conduct their own research. Emma can feel that their meeting is going south and that she faces similar challenges as Prof. Weis at LONA Science Centre. Think about what Emma, David and Rebecca talk to each other, and embellish the dialogue with details.

Play round 1:

Start your freestyle dialogue. Emma (1) steps in last.

Play round 2:

Switch roles. Start your dialogue again. Emma (2) steps in last referring to implicit and explicit codes and regulations for collaborative group work.

Play round 3:

Switch roles. Start your dialogue again. Emma (3) steps in last using the words “open”, “transparent”, “logical” and “reasonable”.

4 Discuss academic integrity:

Put all the tables and chairs back in place. Discuss in class:

- What hinders collaborative work, and why?
- What are your experiences with collaborative work?
- How can somebody ask for and establish academic integrity in collaborations?

5 Establish guidelines for future work groups:

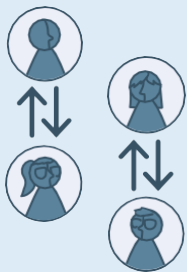
To learn how research is done and how to gain knowledge collaboratively, students should

1. _____
2. _____
3. _____

Write these guidelines into your notebook.



Academic integrity means “[c]ompliance with ethical and professional principles, standards and practices by individuals or institutions in education, research and scholarship”. (Tauginienè, L. et al. (2018) Glossary for Academic Integrity. ENAI Report 3G, online.)



S05

Society needs reliable information: Be aware of fake news!

Description and background

This learning unit:

- Introduces citizens to reliable information*
- Enables citizens to differentiate between casual texts, propaganda and research papers*
- Emphasises an understanding of reliable research results in our knowledge-based society*



*An advocate for
research integrity*

Philippe Grandjean

Keywords

*Disinformation and misinformation;
reliable sources; references; citations*

This unit has been prepared for non-disciplinary learning groups.

Learning objectives

- 1 Understand the importance of reliable research results*
- 2 Describe criteria for reliable academic information*
- 3 Explain the importance of correct citations and reliable sources*
- 4 Weigh different criteria for academic writing*

Learning stages

- 1 Become familiar with the topic*
- 2 Dive into an interesting story*
- 3 Discuss the importance of reliable sources and correct citation*
- 4 Engage in storytelling*
- 5 Reflect on rules for academic writing*

**“High ethical standards are necessary in science publication.”
(Philippe Grandjean, an advocate for research integrity)**





1 Become familiar with the topic:

Read your school's or department's guidelines on citation and academic writing, if they exist.

2 Dive into an interesting story:

Review or look up the story from LONA Science Centre (video or text).

Briefly summarise the story.

Choose one who reads aloud in front of the class:

Imagine that Prof. Weis decided not to manipulate the results, and that she continued to conduct research. Today Prof. Weis meets with the mayor and the head of the fire brigade to discuss how to improve trainings for firefighters. With strength Prof. Weis squeezes the papers in her hands, which contain results from her, several other credible, trustworthy and objective references such as 'Surinares, K. (2019) Helping firefighters to survive extreme wildfires, Journal of Scientific Research, 56(4), 55–59.'

which argue to alter the trainings routine.



Assess reliability

- Check how scholarly the paper is. To inform not to persuade should be the main purpose.
- Check how accurate, complete and unbiased the information of the paper is. Compare the content to other sources.
- Check if the paper has taken status quo and existing evidence into account. Look at the paper's references and compare them with other sources.
- Check the expertise of authors and publishing organisations. Consider their education, experience and standing in the scientific community.
- Check how up to date the paper is. Search for more recent findings, and/or if these papers state the original argument. The original (older) source is more valuable than secondary sources.

3 Discuss the importance of reliable sources and correct citation:

As a class, share what you know about the following terms:

- What is a reliable source?
- What is a scientific source?
- What does it mean to cite?

4 Engage in storytelling:

Come together in small groups (three to four people) and write down a short story about Prof. Weis defending her findings to be reliable against the mayor and the head of fire brigade.

Insert in your story criteria for reliable academic information and underline them.

Read some of your stories aloud.

To ensure reliability academic writing contains

1. Direct quotes

Authors use someone's text (or image, chart, table etc.) word-for-word, stating the source and original author. They indicate where the original text starts and ends by enclosing the quoted section in quotation marks. They add a reference at the end of the quote.

2. Paraphrases

Authors take a statement, idea or text of somebody else and tell it in their own words. They acknowledge the original source by using a reference at the end of the paraphrased session.

3. Summaries

Authors describe the basic idea of a piece of work in their own words. They state the original source of the summarised ideas.

(This section was prepared by Lisa Häberlein.)



5 Reflect on rules for academic writing:

Come together as a class.

Collect the criteria you have underlined on a chalk board and turn them together into rules for academic writing. Write them into your notebook.

In which situations do rules from the chalk board contradict each other? Which rules are important when?



Researchers, research institutions, scientific journals, government and regulatory agencies as well as funding agencies all safeguard good research and ensure reliable research results! (cf. ECoC 2017, p. 5)

Description and background

This learning unit:

Introduces students to the research environment

Challenges students to value good research and reliable research results

Enables students to realise guardians in research

Emphasises that research is embedded in a broader research environment



An advocate for research integrity

Albrecht Beutelspacher

Keywords

Research integrity; codes and regulations; research environment; guardians; ombudsperson; data management officer; research ethics committee

This unit has been prepared for non-disciplinary learning groups.

Learning objectives

- 1** *Identify, accept and actively use research rules*
- 2** *Realise the existence of research codes and regulations within research institutions and organisations*
- 3** *Review rules from clear research codes and regulations*
- 4** *Request that researchers follow research rules*

Learning stages

- 1** *Become familiar with the topic*
- 2** *Dive into an interesting story*
- 3** *Engage in storytelling*
- 4** *Put the pieces together*
- 5** *Reflect on rules for researchers*

“Universities and research institutions can promote research integrity at various levels. There are codes of good scientific practice and there are appropriate committees that monitor compliance in case of conflict.” (Albrecht Beutelspacher, an advocate for research integrity)





1 Become familiar with the topic:

Find out who in your region observes and helps in situations that jeopardise research. Search for the following words: ombudsperson (ombudsman), data management officer in research or research ethics committee. Find out what they do, their contact information for your region and if possible their task description. Bring this information to your class.

2 Dive into an interesting story:

Review or look up the story from LONA Science Centre (video or text). Briefly flesh out what characteristics the students (Emma, Rebecca and David) and two researchers (Prof. Weis and her colleague) have. Imagine the story continues as follows:

Mr. Liebling, the class teacher, starts a project week with his students called "Research integrity" to analyse what happened at the research institution that some of his students had visited. He wants his students to understand why such incidents do not conform to the guidelines of good research.



Researchers with research integrity generate results that society can rely on. They are able to explain step by step how they arrived at their research results. Furthermore, the results should be reproducible by others. Researchers with research integrity use the standards of their research discipline as a guideline from the first idea for new research to the end of the research process.

Researchers are both supported by and observed within their research environment. Some people specialise in observing and advising to keep research reliable and trustworthy. Their tasks are outlined in research ethics committee policies, codes for good scientific practice, task descriptions of ombudspersons, declarations of data protection etc.

3 Engage in storytelling:

Build groups of three to four persons. Imagine you are Mr. Liebling's students. You plan to write one scene of a play telling Emma's, Rebecca's and David's story.

Discuss the following topics before you start writing:

1. Who are the actors in your play?
2. Should Emma contact guardians of research integrity (such as an ombudsperson, a data management officer in research or a research ethics committee)?
3. Which research policies exist in your region and can be used in the play? Are there institutional regulations your actors can refer to? Or national regulations? What about European regulations? Search for relevant documents and refer to them.

Your scene should include a dialogue about good research. By putting honesty, respect, reliability and accountability first, your actors should emerge from the conflict and stand up for research integrity. Write your scene.

Read some of your stories aloud!

[European Code of Conduct for Research Integrity](#)



4 Put the pieces together:

Take a short break from your stories. Come back together as a class. Collect your information about your research environment by showing your material on ombudspersons, research ethics committees and data officers. Decide together what information is important for your region, and write it down in your notebook.

5 Reflect on rules for researchers:

Return to your stories with the groups you were working in earlier. Imagine that other students will watch your scene. Decide together which rules of research behaviour your fellow students should learn through your scene.

Researchers should _____.

Researchers should _____.

Researchers should _____.

Researchers should _____.

What do ombudspersons do?

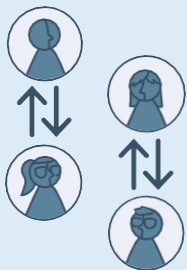
They can be called to enforce the rules of good research practice in the event of suspicion of misconduct. All enquiries and procedures will be treated confidentially and impartially. The support includes advice, assessment and recommendation (first advice also by telephone or email).

What are data management officers in research?

They ensure and monitor compliance with the research data management policy and provide technical support.

What are the tasks of a research ethics committee?

Research ethics committees assess ethical issues in research projects, provide information and advice in compliance with legal requirements, professional rules and research standards. The support includes advice, assessment and recommendation.





Researchers follow their aims in a careful and well-considered manner!
(cf. ECoC 2017, p. 5)

Description and background

This learning unit:

Introduces students to research and to the processes required to produce reliable research results

Stresses the importance of reliable research results in our knowledge-based society

Challenges students to listen and speak up as well as to explain and be able to justify research norms



An advocate for research integrity

Tymon Zieliński

Keywords

Good research practice; reliable research results; research integrity; research procedures; research misconduct

This unit has been prepared for non-disciplinary learning groups.

Learning objectives

- 1** *Describe criteria for research procedures*
- 2** *Listen actively about how to do research*
- 3** *Argue in favour of well-considered research for the benefit of science and society*

Learning stages

- 1** *Become familiar with the topic*
- 2** *Dive into an interesting story*
- 3** *Engage in storytelling*
- 4** *Collect arguments for responsible research conduct*

“Scientific research is a critical building block of modern societies. So if societies are to properly grow and flourish, it is imperative that research be conducted with impeccable procedures and methods.”
(Tymon Zieliński, an advocate for research integrity)





1 Become familiar with the topic:

Homework (before the unit starts) or reading session

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

Take notes and discuss the meanings of any unknown words.

[European Code of Conduct for Research Integrity:](#)



2 Dive into an interesting story:

Review or look up the story from LONA Science Centre (video or text). In pairs, consider what kind of research fits best into the story: experiments, surveys, observation, literature reviews or others? Justify your answer.

3 Engage in storytelling:

What would you advise Prof. Weis to do? Discuss with the person sitting next to you.

Collect your advice to Prof. Weis on a chalk board or flip chart. Do your advices promote good research practice? If yes, why?

Now imagine the story continues as follows: “No!”, Prof. Weis thought, “the test results weren’t worth it. I won’t give up my career for that.” She quickly walked down the hall into her office, grabbed the top pile of paper and tore it up before she even thought about it. “That’s it. I’ve really done it.” Now, she would enter the results that her colleague wanted. “I want to stay at this institution.”, she told herself. That was her justification.

Build groups of three to four persons and continue the story, this time following basic values and norms of conduct that speak in favour of careful and well-considered research. Fill the story with sentences that argue in favour of good research procedures. Also include the advices to Prof. Weis you have previously collected.

Read some of your stories aloud.

What is research?

Research is a quest for knowledge that is conducted in a way that is systematic, calculated, considered, well planned, thought out in advance etc. Researchers...

- ...discover and design things along the way as they work;
- ...plan their research thoughtfully;
- ...gather information and analyse it to better understand it;
- ...publish their results and disseminate their knowledge.

Progress in society is often driven by research. Think of space travel, penicillin, de-escalation strategies, smart homes etc.

4 Collect arguments for responsible research conduct:

Come together in pairs and ask each other the following questions:

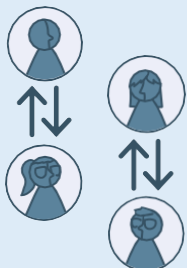
1. What could happen if the falsified results are published?
2. What might happen if Prof. Weis publishes the real results?
3. Do you think it is important for society that Prof. Weis publishes honest research results? Explain why (or why not).
4. How can Prof. Weis argue that research should be taken seriously?

Collect the answers on a chalk board or flipchart.

Compare the story in which Prof. Weis destroys the original test results and plans to enter falsified results with the ones you wrote.

Which of those stories stands for careful and well-considered research, and why?

What does it take for researchers to conduct research in a careful and well-considered way?



S3

“Researchers comply with codes and regulations” (ECoC 2017, p. 7)

Description and background

This learning unit:

- Introduces students to research codes and regulations safeguarding research integrity*
- Encourages students to persist in an open and transparent, logical and reasonable rational dialogue about research codes*
- Emphasises safeguards by which research integrity is maintained*
- Requires criteria for the promotion of good research and the dialogue on it*



An advocate for research integrity

Bogusława Dorota Gołębiak

Keywords

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

This unit has been prepared for non-disciplinary learning groups.

Learning objectives

- 1** *Refer to codes and regulations*
- 2** *Listen actively and present own wishes, aims and goals*
- 3** *Establish an open and transparent, logical and reasonable dialogue about research codes and regulations*
- 4** *Realise that structural violence hinders good research*

Learning stages

- 1** *Become familiar with the topic*
- 2** *Dive into an interesting story*
- 3** *Invent characters*
- 4** *Engage in rotatory role play*
- 5** *Identify criteria for good research*

**“If science is to serve society – whether by providing applications resulting from research findings or by providing knowledge that facilitates understanding of the processes in which we find ourselves – research results must be reliable knowledge.”
(Bogusława Dorota Gołębiak, an advocate for research integrity)**





1 Become familiar with the topic:

Homework (before the unit starts) or reading session

Read the paragraph on safeguards in “The European Code of Conduct for Research Integrity” and discuss the meanings of any unknown words.

Now, think about protective measures that play an active role at your institution.

**European Code
of Conduct
for Research
Integrity:**



2 Dive into an interesting story:

Review or look up the story from LONA Science Centre (video or text). Together, discuss which research integrity safeguards are at risk here. Try to answer the following questions by telling different endings of the story:

- Do researchers follow their codes for research integrity?
- Do researchers respect their research subjects?
- Do researchers respect the welfare and safety of the community?
- Do researchers consider possible risks?
- Do researchers realise significant differences in their protocols?

3 Invent characters:

Put yourself in the situation in which Prof. Weis and her colleague are in conflict. How does Prof. Weis experience the problem? What is her colleague’s position? What is on their minds and what could they say?

Draw the counterparts on a piece of paper and add speech or thought bubbles to the sketches. Pass your sheets through the class and read the other figures’ speech bubbles carefully.

Collect all the sheets and put them on the wall. Meet in front of the wall as a class and read some of the speech bubbles out loud!



Researchers should...

1. express interest and remain unprejudiced;
2. be able to communicate and justify their argument;
3. be ready to explain where their argument comes from;
4. reason logically and in a way that is easy to understand.

4 Engage in rotatory role play:

Now come together in pairs and do a role play.

Put all the tables and chairs aside and spread out in the room. Play a dialogue between Prof. Weis and her colleague, in which both present their thoughts, concerns, wishes and goals. **Carefully listen to your counterpart.**

In the role of Prof. Weis, demand an open, transparent, logical and reasonable dialogue on the acceptance or rejection of research codes and regulations. Request your colleague not to force anyone to agree to ambiguous arguments but to justify their statements. In the role of the colleague, do not stick to your opinion even though you know better, but accept better arguments and remember that the power of your social status cannot replace good arguments.

Switch roles.

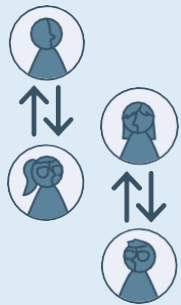
What makes a good argument for maintaining research integrity? Collect basic characteristics, objectives and possible obstacles to argumentation on a chalk board or flipchart.

5 Identify criteria for good research:

Put all the tables and chairs back in place. Discuss the following questions with the person sitting next to you:

- What arguments for compliance with principles of research integrity are most convincing?
- How can you resolve the conflict of interest or end the conflict situation?

Each of you should write down one rule (expanding the collection from the yellow box) using the following phrase: *To enable an open and transparent dialogue at eye level about research codes and regulations, researchers should...*



S4

Research groups work as transparently and openly as possible! (cf. ECoC 2017, pp. 6–7)

Description and background

This learning unit:

Introduces students to research collaborations

Challenges students to understand the conditions of good collaborative research

Enables students to understand research agreements

Emphasises the recognition of roles and responsibilities in research collaborations



An advocate for research integrity

Kristina Bliznakova

Keywords

Reliable working relationships; mistrust; agreement; research roles and responsibilities; openness; transparency; respect

This unit has been prepared for non-disciplinary learning groups.

Learning objectives

- 1** *Listen actively and present aims and wishes in research groups*
- 2** *Learn to respect and accept the aims and wishes of others in research groups*
- 3** *Practice understanding and being understood in a dialogue*

Learning stages

- 1** *Become familiar with the topic*
- 2** *Dive into an interesting story*
- 3** *Engage in role play 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)**



1 Become familiar with the topic:

Homework (before the unit starts) or reading session

For basic explanations of collaborative work, you can watch the short video “Collaborative Research Solutions” by Graham Sustainability Institute. In your own words, what is research collaboration?

Read the paragraph on collaborative working in “The European Code of Conduct for Research Integrity” and discuss the meanings of any unknown words.

Look up Path2Integrity’s comic about collaborative work, “Building a Foundation”. What can you see? Which principles play a role?

[Collaborative Research Solutions \(Graham Sust. Institute\):](#)



[European Code of Conduct for Research Integrity:](#)



[Building a Foundation \(Path2Integrity\):](#)



2 Dive into an interesting story:

Review or look up the story from LONA Science Centre (video or text). The research the students are talking about is a collaborative research project studying how people react in stressful situations. The results will be used to adapt professional training programmes for firefighters, police and rescue crews.

Sketch the different roles within this research project by drawing stick figures for each of the following four collaborative players on your classroom chalk board or flip chart:

Prof. Weis’ team

LONA Science Centre
conducting the research

Police & fire brigade

funding the research

Prof. Surinares

Pakistan
collecting additional data

Education agency

developing evidence-based training courses for fire fighters and police officers

Embellish the stick figures with representative heads and coat buttons.

3 Engage in role play and come to an agreement:

Be open and transparent so that the research can flourish.

In groups of three or four, imagine that each of you is one player in this collaborative research project. You are all reluctant to cooperate because in your last collaborations you experienced disagreements and disrespectful accusations. But this research project is too important to fail. Future fire fighters and police officers, as well as the people who rely on them, are depending on your results being reliable. That is why you want to establish a strong base from the beginning.

Allocate a stick figure to each person and take on that role. Prof. Weis’ team fears overly protective partners. The police and fire brigade fear communication problems. Prof. Surinares fears unequal contributions from the different participants and getting insufficient recognition. The education agency needs clarification about roles and responsibilities in this undertaking.

Ask your partners what they expect from your cooperation. Make sure that you all understand each other correctly. Each of you should use the following phrase at least twice:

Do I understand you right that you want me to...

Leave your group and consider the wishes you heard from your project partners. To avoid jeopardising the research project, draft a contract in which you pay attention to fulfilling your partners’ wishes.

Come back together in your group and compare your drafts. Discuss if differences appear and alter the texts until all partners agree.

Research collaborations

Research collaborations can help increase the likelihood of finding answers to challenging questions. At the beginning of a collaboration, in order to be successful, all collaborators agree on

- taking on “[...] responsibility for the integrity of the research”;
- “[...] the goals and [...] the process for communicating”;
- the “[...] expectations and standards [that will apply]”;
- the “[...] procedures for handling conflicts and possible cases of misconduct”;
- being “[...] properly informed and consulted about submissions for publication of the research results.”

(ECoC 2017, pp. 6–7)

4 Reflect on collaborative research:

Come together as a class and discuss:

- What advantages does collaborative research have?
- What pitfalls exist in research collaborations and how can they be overcome?

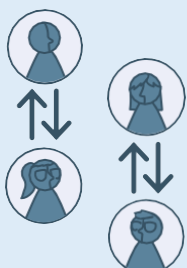


Research / espionage

Shared knowledge / secret information

Openness / mistrust

Transparency / disguise



S5

Researchers ensure appropriate authorship and citation! (cf. ECoC 2017, p. 7)

Description and background

This learning unit:

- Introduces students to research and to academic writing and publishing*
- Enables an understanding of the importance of research papers' contribution in our knowledge-based society*
- Challenges students to learn common rules in academic writing and to comply with these rules*
- Emphasises the difference in writing style between casual texts and research papers by looking at the criteria for both*



An advocate for research integrity

Philippe Grandjean

Keywords

Academic writing; author; editor; citation rules; writing procedures

This unit has been prepared for non-disciplinary learning groups.

Learning objectives

- 1 Understand academic writing procedures*
- 2 Describe criteria for good academic writing*
- 3 Explain the importance of citation*
- 4 Weigh different evaluation criteria you can use when writing academic or non-academic papers such as fiction*

Learning stages

- 1 Become familiar with the topic*
- 2 Dive into an interesting story*
- 3 Understand academic writing procedures*
- 4 Engage in storytelling*
- 5 Reflect on rules for citation*

“High ethical standards are necessary in science publication. However, what does an editor do when identifying a possible breach of ethical standards in another journal?”
(Philippe Grandjean, an advocate for research integrity)





1 Become familiar with the topic:

Homework (before the unit starts) or reading session

Read your school's or department's guidelines on citation and academic writing, if they exist.

Watch the video "Refairance" from the University of Konstanz.

Discuss the meanings of any unknown words.

["Refairance"](#)
[\(University of Konstanz\)](#)



2 Dive into an interesting story:

Review or look up the story from LONA Science Centre (video or text). Briefly flesh out what characteristics the students (Emma, Rebecca and David) and the two researchers (Prof. Weis and her colleague) have. Imagine that Prof. Weis decided not to manipulate the results, and that she now works at a university. Together, please read aloud:

Two years ago, Prof. Weis read a remarkable research paper that had just been published. In it, the author praised Prof. Weis' work. The paper discussed the results of several researchers working in the same field. By including the latest findings from a Pakistani researcher named Kim Surinares, the paper opened up a new way of thinking about the topic and received a lot of attention. "Those were exciting times!", Prof. Weis remembers.

Now, two years later, Prof. Weis is in contact with Surinares, and some of her graduate students have begun to study his findings in depth. Developing his ideas further led to completely new insights. Gratefully, Prof. Weis runs her finger along the reference that started her on this new line of investigation: "Surinares, K. (2019) Helping firefighters to survive extreme wildfires, *Journal of Scientific Research*, 56(4), 55–59."

3 Understand academic writing procedures:

Copy the reference of Kim Surinares' paper into your notebook. Carefully check whether you copied every character. Exchange notebooks with a partner and check one another's references, giving feedback and, using another colour, making necessary corrections.

As a class, share what you know about the following terms:

- Author
- Editor
- Citation
- Scientific journal or book
- Article

4 Engage in storytelling:

Come together in small groups (three or four people) and write down a short story about Emma writing an academic paper citing Prof. Weis' article: Weis, L. (2012) Firefighters in Action, *Journal of Social Reaction*, 12(1), 114–121, in which she had published the results of the study from LONA Science Centre. Write the story in your notebook.

Insert and underline in your story why Emma is citing this article.

Read some of your stories aloud!



Citation rules for a journal article (APA style):

Author surname, initials. (Year) Article title. Journal title, volume number (issue or part number), page numbers.

Surinares, K. (2019) Helping firefighters to survive extreme wildfires. *Journal of Scientific Research*, 56(4), 55–59.

Citation rules for a chapter in an edited book:

Author surname, initials. (Year) Chapter title. In: Editor surname, initials (Ed.). Book title (page numbers). Location: Publisher.

Weis, L. (2017) Firefighters Actions under Pressure. In: Surinares, K. (Ed.). *About Reaction Times* (34–49). Berlin, London, Budapest: Xuna Publication.

5 Reflect on rules for citation:

Collect your underlined arguments on a chalk board or flip chart. Discuss why it is important to use citations in research.

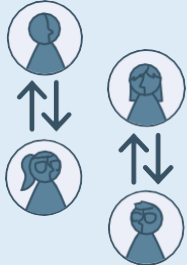
What is the purpose of ...

What is the difference between ...

A creative story that tells us about a hero who uses approach A to rescue victims from a fire

vs

An academic paper that outlines approach A from another researcher on how to rescue fire victims



S9

A researcher is responsible for reliable conduct and trustworthy results!

Description and background

This learning unit:

Introduces students to commitments of responsible researchers

Enables students to demand research integrity

Challenges students to ask for and demand professional commitments

Emphasises how important research integrity is for science and society

Please ensure to obtain informed parental consent and informed assent from participants if required in your country or in your institution.

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.

This unit has been prepared for non-disciplinary learning groups.



An advocate for research integrity

Anna Wójcicka

Keywords

Professional commitment; responsible research; research integrity; self-declaration; reliability

Learning objectives

- 1** *Realise self-declarations to follow research integrity*
- 2** *Make a students' pledge of research integrity together with the dialogue group*
- 3** *Compare and prioritise solutions of research integrity issues*

Learning stages

- 1** *Reflect on what you have learned*
- 2** *Dive into an interesting story*
- 3** *Connect to your own life*
- 4** *Commit to academic integrity*

“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)



1 Reflect on what you have learned:

Together with the rest of your class, go online and answer the questionnaire to evaluate the learning units, with everyone starting at the same time.

<https://path2integrity.eu/limesurvey/index.php/714871?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 Dive into an interesting story:

Recall or read Emma's chat and then continue with the following story about Prof. Weis:

Prof. Weis' hands were sweating, but her thoughts were clear. After she had quit her job at LONA Science Centre and transferred to another university, she had felt a huge relief. In leaving her colleague and the research project, she had upheld her research principles.

Her back ached in this uncomfortable chair. She was sitting in the audience at a conference, and her former colleague was standing at the podium explaining the significant results that he claimed to have made in his research.

Prof. Weis waited tensely until his talk was over. Then she stood up and asked in front of the attentive research community: "Can you confirm that you followed good research practice for the duration of the project, and that all of the research results you have presented are reproducible and thus reliable?"

Discuss different endings of this story. What do the terms reproducible and reliable mean and what significance do they have for science and society? In which cases would you request such a self-declaration from a researcher?



An example of a researcher's pledge:

"By accepting my Doctor of Philosophy degree, I earnestly assert that I will apply my scientific skills and principles to benefit society; I will continue to practice and support a scientific process that is based on logic, intellectual rigor, personal integrity, and an uncompromising respect for truth; I will treat my colleagues' work with respect and objectivity; I will convey these scientific principles in my chosen profession, in Mentoring [sic], and in public debate; I will seek to increase public understanding of the principles of science and its humanitarian goals. These things I do promise." (Ravid, K., & Wolozin, B. (2013). The Scientist's Pledge. *Academic Medicine*, Vol. 88|6, p. 743.)

3 Connect to your own life:

In pairs, read and consider the following:

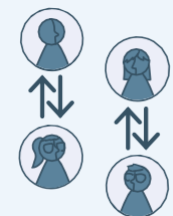
At school as well as in your studies you learn about research procedures and even do some research in class or as homework. You have probably already written a paper or conducted an experiment. Are you familiar with the standards of such research work? Maybe you are acquainted with a school policy or you already had to attach a signed self-declaration to a paper? However, you may still feel insecure about various research practices. Don't worry. You will succeed!

But even if you are familiar with good research practices, there may always be situations where certain incentives might open the door to fraud or misconduct. To succeed in the field of research, it is not only necessary to know how to do it, but also to understand and comply with the values of good research practice.

Draft a declaration in which you as a student can pledge to confirm your commitment to good research practice in your lives, for example when writing a thesis, conducting an experiment, making an interview, observing the work of others etc.

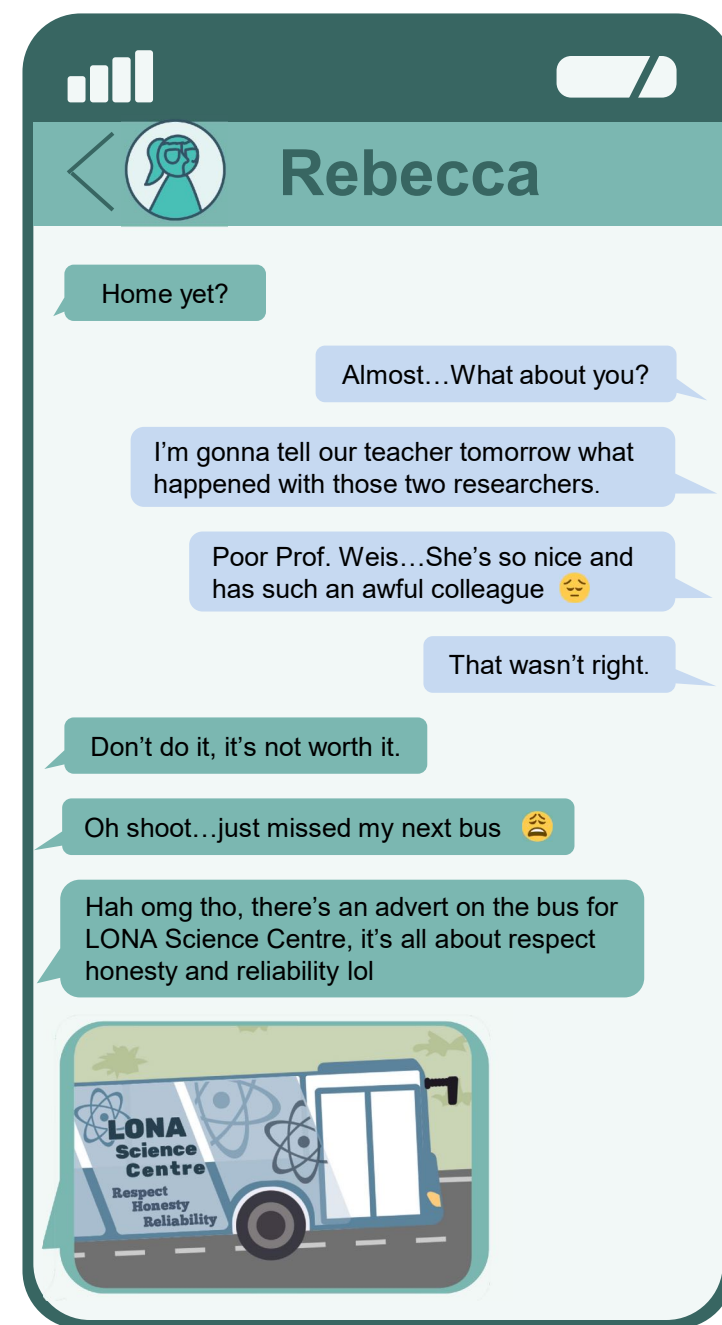
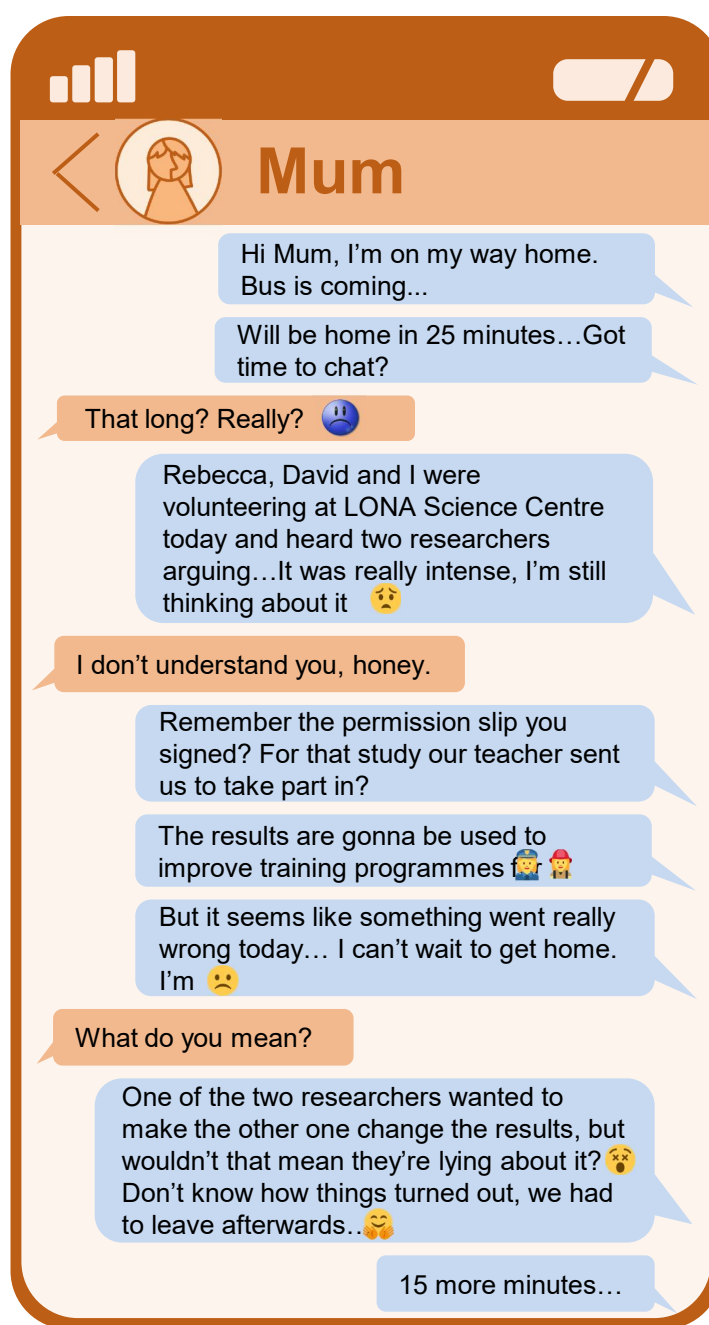
4 Commit to academic integrity:

Get back to class and read your pledges out loud. Decide which pledge best suits your class and write it in your notebooks. Conclude this session by reading the pledge out loud together.



Emma's chat

What happened at LONA Science Centre?





Hannah's protocol



To: rory.rory@hotmail.com
Cc:
Subject: Protocol
From: hannah-p@gmail.com

Dear Rory,

Thank you for delegating your voting rights in the board meeting to me. After wading through the boring agenda items, things got exciting when it came to establishing a research integrity policy. I initially didn't know what to do or what the term research integrity meant, but the arguments in the room finally convinced me to vote in favour. I hope I represented you well with my vote. Would you have voted for a research integrity policy, too? Here is a rough transcript of the meeting. See you tomorrow?

All the best,
 Hannah

Meeting organis...

Research integrity

Thank you to everyo
 attended. Attached
 minutes from the m

Rory

Board meeting

Hi Hannah, could yo
 board meeting? I wo
 delegate my vote.

Protocol

Agenda topic 5: Research integrity policy

Discussion:
 Do we need
 a research
 integrity
 policy?

Member 1:

This is really, vitally important; we need to have solid, transparent rules around ethics and research methods, or this institution's reputation will be a joke.

(General agitation; Whispers in the hall; Call from other member: "Don't overdo it!")

Member 2:

You can't regulate honesty. There are just too many different circumstances to be able to account for all of them with individual rules, and we certainly don't need more administration here. You can only encourage people to do the right thing or hire people who have values like honesty and integrity, and the institution already has a code of conduct for that.

(Call from other member: "Exactly, why more paperwork?")

Member 3:

Doesn't each discipline have its own professional code and standards anyway? A research integrity policy for the whole institution doesn't make any sense, as accepted practices differ too greatly from field to field.

(Sounds of approval and positive comments)

Member 1:

A research integrity statement is needed to establish values and processes. These would help address specific issues like authorship, scientific rigour and data management, as well as aid in investigations of scientific misconduct.

(General agitation; Call from other member: "Why would we need that?")

Member 4:

It's all about being clear on what we expect at this university and giving people the tools to navigate tricky issues. We believe you can't have research excellence without integrity in research.

