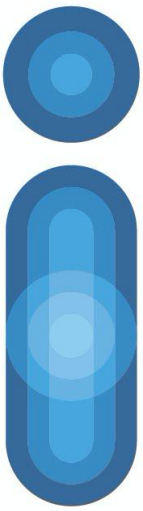

INTEGRITY

Teacher Manual

for RCR courses INTEGRITY

(draft May 2021)

This project received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No 824586

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Introduction

Before you lies the teacher manual for small private online courses that have been developed as part of a broader project on developing educational tools for three target groups on responsible conduct of research (RCR), in the project H2020INTEGRITY. For more information on the project see www.h2020integrity.eu. Eleven partners from nine European countries have been working together to survey the needs and knowledge of upper-level highschool students, undergraduate students and early career researchers. Together with Elevate Health (https://elevatehealth.eu/) we developed small private online courses (SPOC) for the target group PhD students. In total, 3 SPOCs on topics in research integrity were developed. The course topics and perspectives taken are based on the result of literature study (what are characteristics of effective RCR courses) and a survey on current knowledge and needs of students which was conducted in nine European countries. The courses were piloted and tested in several runs to test the technical feasibility of the courses in various contexts. The content of the courses have also been moderated based on the test results. Now it is up to teachers in EUrope to work with these courses. The idea is that all can use these courses, yet have to respect the teaching philosophy in these courses and can use these for free if they do the moderation themselves. If you would like us to do the teaching for you, please contact us, and we will make arrangements (a small fee is necessary to make teaching hours available) with you. We hope that these courses contribute to the community of scholars that teach on issues of research integrity. May we all be inspired to start teaching more on these topics, and stimulate open debate on topics of integrity!

What is a SPOC?

Early in the twentieth century the sociological learning theory of social constructivism emerged, stating that 'Social interaction is the origin and engine of learning.'

Social learning is learning from each other. By interacting with others, students acquire new knowledge and skills. Social learning underlines the importance of observing and modelling behaviour, attitudes, emotions and reactions of others. It emphasizes the importance of social interaction (e.g. group discussions, group assignments), and giving and receiving peer feedback.

To allow for optimal social interaction and constructive learning in an online learning environment, the SPOC model was born. The SPOC model, a small private online course, allows for participants to learn through social interaction, in a small and private online course.

The small group size, usually not larger than 25 participants, allows all participants to be able to read, react and learn from each other's responses and contributions. This also creates possibilities for social bonding in an online environment and provides room for personal attention, building professional relationships with your peers. The private aspect of the course is important to allow an open and safe environment, where participants are encouraged to share their thoughts and experiences. All participants introduce themselves, similarly to the teaching and moderating staff, thus creating a social cohesive group which should feel comfortable and confident in sharing ideas, opinions and knowledge. Another advantage of this strong social framework is that participants tend to finalize their online learning, thus resulting in higher completion rates.

A final characteristic for SPOCs is the visibility and facilitatory role of both a teacher and e-modator in the course. This team aids participants in the course, both with content-related and more functional related aspects. Gilly Salmon (2011) introduced the term e-moderator, describing the role as: "promoting human interaction and communication through the modelling, conveying and building of knowledge and skills. An e-moderator undertakes this feat through using the mediation of online environments designed for interaction and collaboration''. An e-moderator plays a crucial role in aiding the social learning process during SPOCs and supports the teaching staff concurrently.

Early 2020 we developed three online educational courses, namely small private online courses (SPOCs) on RCR. As mentioned above, SPOCs are characterized by a small number of participants, by visibility of a teacher/instructor who aids participants in the course, and a sequence of smaller learning units to help participants to socially contribute to the learning process and spread the workload over the course period. Usually, participants know each other and are actively involved in the course via (group)assignments and (peer)feedback. A

schedule is maintained, to allow participants to work on similar items synchronized. Even though this is slightly less flexible than more open-ended online learning, this does improve social cohesion, learning outcomes and completion rates. In the end, students often can obtain accreditation and/or a certificate (Uijl SG, Filius RM, and Ten Cate, O 2017). Together with the company Elevate Health we developed 3, 4 or 5 week courses with an average workload of 2-3 hours per week for each participant.

Teaching philosophy in all SPOCs

For the project, we developed a teaching philosophy that is used both to develop educational materials for upper level highschool students, undergraduate students and early career researchers. The result of the teaching philosophy is described in a competency profile (see appendix 7.4 for the full profile). The overall learning objective of the INTEGRITY project is to stimulate *empowerment* towards responsible conduct of research. The notion of empowerment has been utilized based on writings in the literature on empowerment, starting with Paulo Freire's *Pedagogy of the Oppressed* (Freire, 1970), characteristics found in the literature and these were compared to characteristics of the literature on responsible conduct of research (RCR). As a result, the following main characteristics were defined that shape the idea what empowerment towards RCR entails as a normative concept: empowerment is 1) about building capacities of individual researchers, who function in institutional and systemic contexts of research practices; 2) learning students to take control; 3) learning to develop a critical autonomy and 4) stimulates an attitude of openness, a 'feeling up to' and courage to address issues of integrity in practice. Critical autonomy refers to being able to demonstrate a self-reflective attitude on issues that arise in one's practice and that one is able to determine what role and responsibilities one takes in RI-related situations. Critical autonomy also includes that one is able to independently deliberate and decide on RCR issues one encounters in practice, that one can evaluate the circumstances in one's practice and one's position in it and is also able to develop strategies to become a responsible researcher and that one feels up to act upon decisions. In other words, empowering towards a practice of responsible research behaviour requires a pro-active and reflective attitude and helps students and researchers to dare to speak up. Imagine a high school student who encounters a situation of free riding when working in a group. It is not always easy to address this in the group and change the working atmosphere in group work in a positive manner. In courses designed for high school students, they learn to reflect on what it means to free ride, how to prevent it (by openly discussing each other's contribution from the start for example) and how to dare to say something when things are not going in the right direction.

Taking this view on empowerment as the core starting point for the courses, this has consequences for how we have designed the courses and the assignments.

1. We take a positive attitude towards participants: we do not treat them as potential wrong-doers who 'will fall prey to the claws of misconduct', but we approach them as potential colleagues who want to know what responsible research is about. We help build **capacities**.
2. To this purpose, we try to make people see (increase awareness) what issues of integrity are in practice before we stimulate reflection on these issues. We focus on **grey areas**, and not only on misconduct or detrimental practices (which are there, undeniably), but on daily-life issues in many research practices, having to do with

collaboration, conflict of interests, transparency, stress etc. We offer strategies and feedback for those situations where participants have encountered wrong behavior and help them to find strategies to deal with it (eg consult integrity officers, supervisors, ..)

3. We offer some basic knowledge on RI issues, but mostly focus on learning them **reflective skills**, by offering them cases to reflect on. We developed the so-called RCR reflection model (a case deliberation method) that can help them to explicate relevant considerations, how the case is related to ethical principles (and the code of conduct). It also helps them to think of strategies to solve the issue (or deal with it), including the question who can help you (eg escalating to your superiors is often a good idea).
4. The course is interactive and tries to engage participants. Via assignments (individual and group assignments) we try to activate participants to have discussions together, to share their views and to learn to reflect on issues of integrity.
5. We invite participants to make the course **as relevant as possible to them**. they can use their own cases, and they get assignments where basic knowledge needs to be applied to their own research project. In the course on supervision and mentoring, participants are asked to organise a meeting with their supervisor(s) and discuss RCR relevant issues that they have collected during the course. In the course on Data in research participants are asked to make a kind of SWOT analysis of their own research project and think of strategies where they think working with data might not be responsible yet. Notice that we do use a lot of existing cases in the courses, which often have a focus on life sciences. We will keep working towards an interdisciplinary perspective, by adding examples from different disciplines to the courses. It remains work in progress. Yet, our experiences so far are that participants from all over Europe and from all disciplines appreciated the courses and did not experience that they were not addressed with the examples we gave.
6. We create a **safe course environment:** participants agree at the beginning that they will approach each other in a constructive manner, that no cases and discussions will be used elsewhere outside the course environment. This is to stimulate people to open up and feel secure enough to share their own experiences.

Overview of the SPOCs created in INTEGRITY

SPOC 1: RCR through supervision and mentoring and working together	5 week course, 2.5-3 hours per week	Core assignment: 'challenge' your supervisor with RCR issues you usually do not discuss
SPOC 2: Data in responsible conduct of research	3 week course 2 hours per week	Core assignment: analyse the RCR relevance of use of data in your own project
SPOC 3: Integrity in academic publication: authorship and peer review	3 week course, 2-3 hours per week	Core assignment: learn to constructively review and discuss authorship in your own project

We have created three thematic courses that focus on some well known RCR topics. Each SPOC starts with the same basic structure (and students who take more than one course will recognize this): after some general introductions in Learning unit 0, we introduce the topic of RCR (via a video), and the ALLEA code of conduct (as it is built in a European context). We also have small assignments in the first learning unit, that invites them to apply the code of conduct to their own project (what goes well, what can be improved), and often we start with some first case reflections. Then, we turn to the more thematic parts of the courses.

Overview of the learning units

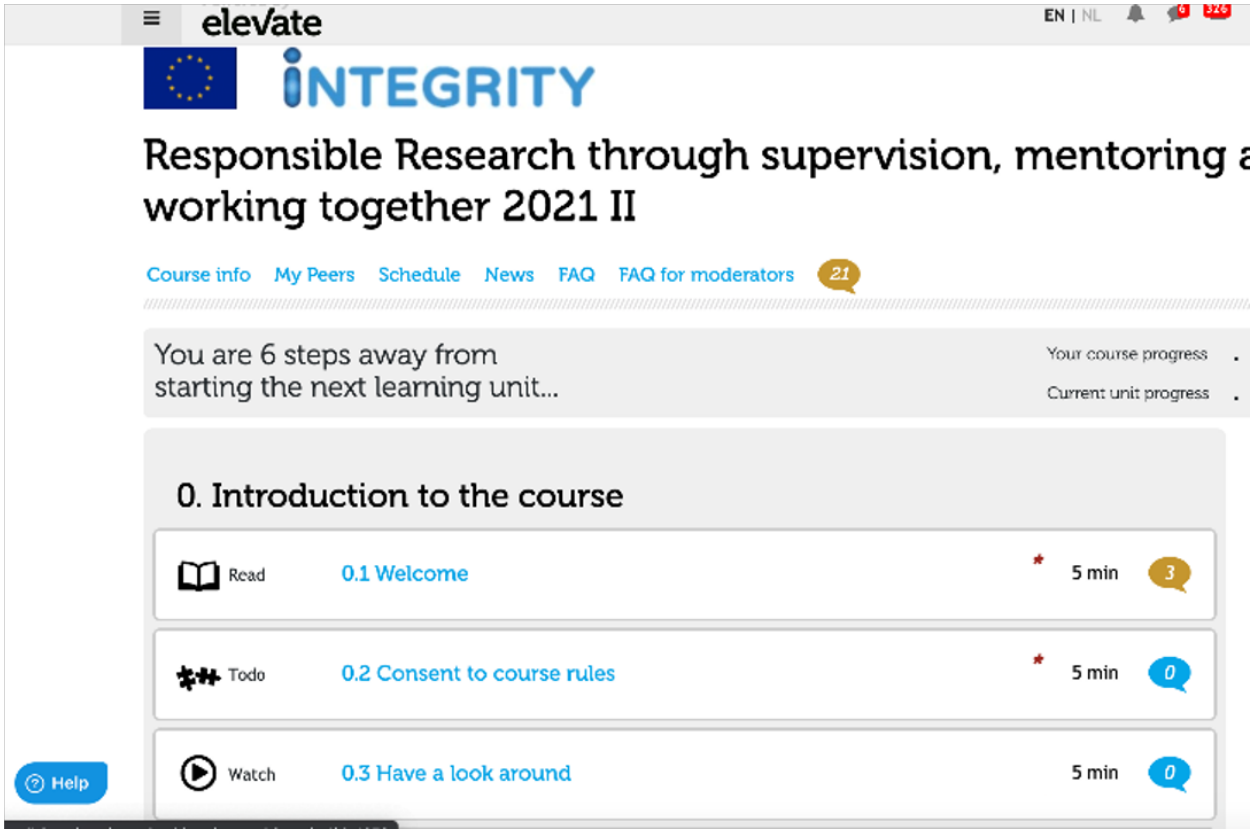
Notice that learning units are content-units. Some units can be quite lengthy, others brief. Thus, in SPOC 2, several LU's can be addressed in one week, while SPOC 1 takes one LU for each week.

	SPOC 1	**SPOC 2**	**SPOC 3**
LU 0	welcome and introduction	Introduction (including intro to RCR)	Introduction (including intro to RCR)
LU 1	Introduction to RCR	RCR and data in research	authorship
LU2	Expectations and responsibilities in supervision and mentoring	Data collection and handling	academic publishing
LU 3	Culture, colleagues and communication	Data analysis	Reviewing

LU4	Collaboration outside the research team	Data storage and management	final reflections and farewell
LU5	learning to take responsibilities and its boundaries	Open Science and intellectual property	
LU	Portfolio	Final reflections and farewell	

For a more detailed overview of the course designs, see the appendices in 7 in this document.

A few impressions from the courses:



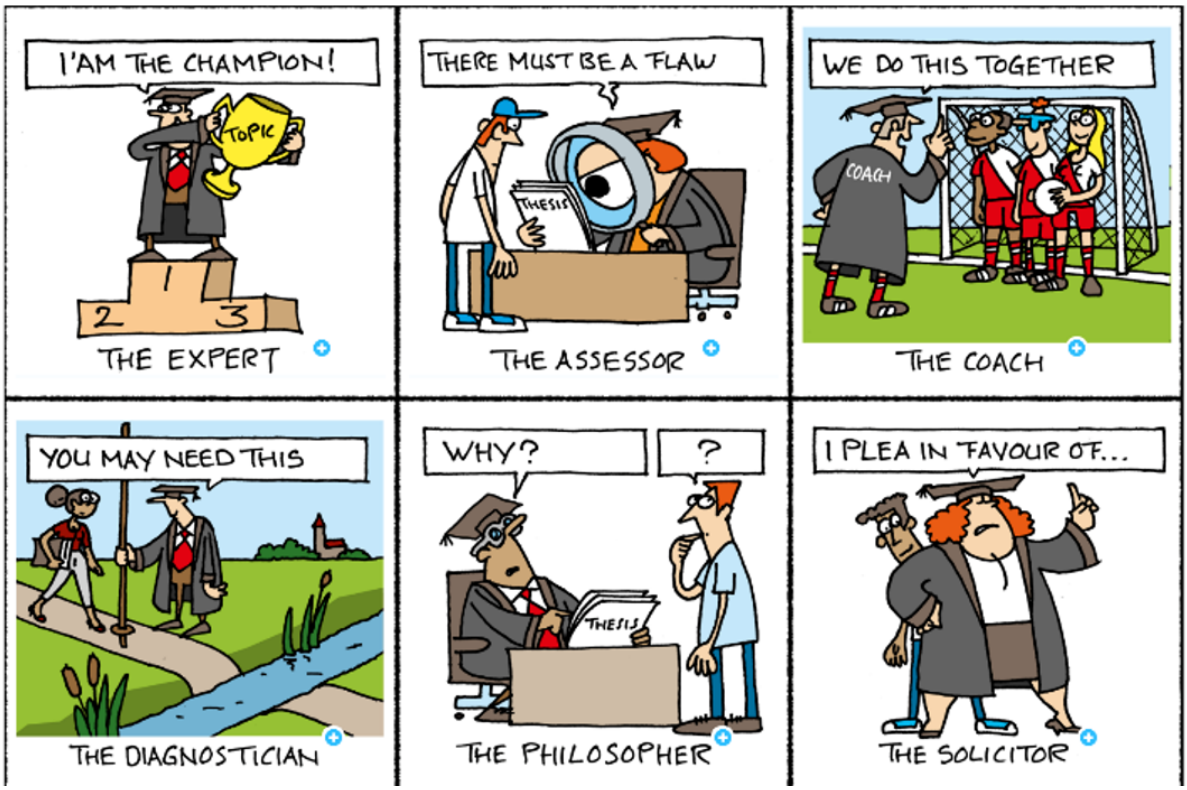
Todo **2.2 Styles of supervision and mentoring** * 25 min

Learning objectives

This activity will increase your awareness of different styles of supervision and mentoring. In addition, it allows you to practice how to respond to a style of choice.

Assignments

1. Supervisors and mentors may employ a range of different styles. The following cartoons will give you some examples. Look at the images and click on [+] to read the explanation.
2. Which role do you recognize in the way you are currently supervised? Use the discussion section to share your views with each other.
3. Which role would you prefer your supervisor to take (more often), and why? Again, use the discussion section to share your views.



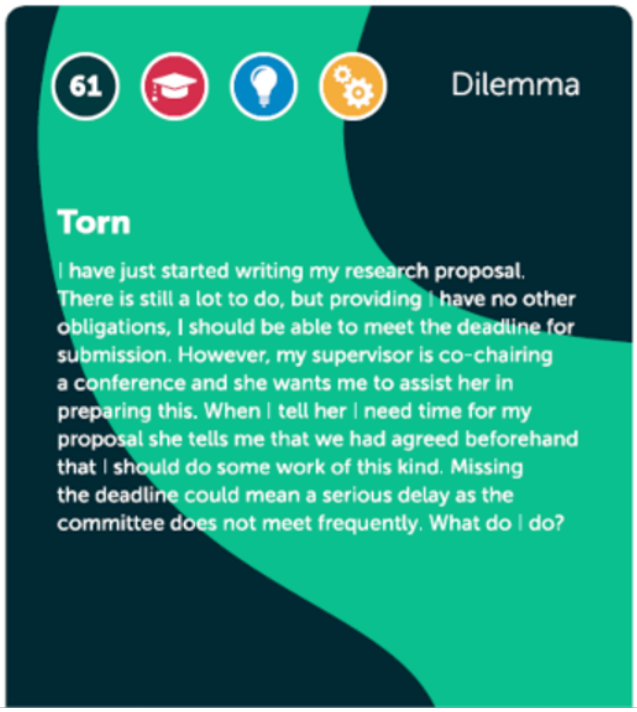
Read+

1.3 The European Code of Conduct for Research Integrity

A central question in RCR is what constitutes "good research practice". The European Federation of Academies of Sciences and Hu
of conduct for this purpose.

Assignment

1. Read the code of conduct, with a focus on the principles at the beginning of the code. The code might be available in your
   European Code of Conduct for Research Integrity -
2. Read the "Torn" case below.
3. Discuss via the discussion section the following question: which of the principles, as mentioned in the code, are relevant in



Moderation of a SPOC

In the supervision of a SPOC we distinguish between moderation and teaching. It could be that one person takes both roles. In that case, the tasks described below should be taken together with the tasks and role in section five. We now describe these tasks as separate, also because the chores differ: moderation focuses on practicalities of a course (do participants receive information on the course in due time, do they get their log in code, are they able to enter the course, do they make sufficient progress, do all the learning units in the course function properly etc. So the moderator is the person taking care of all practical issues, and sees to it that the experience of the participants in the course is a nice one: they feel welcome, know who to turn to and feel 'nudged' in a positive way to be active in the course. One of the pitfalls of all online courses where a teacher is not present all the time is that people start procrastinating (delaying) their course progress. Therefore, a gentle reminder now and then is very helpful...

Below, we have specific information for each of the SPOCs, as each SPOC has its own course dynamics.

Moderator Information SPOC 1

Week before the course starts

- *Confirmation of subscription emails ??*
- Send an email with the course information to all course participants at least one week before the course starts. You can use the course information template for this (don't forget to fill in the name of the teacher, name of the moderator, dates, and name at the bottom of the information file).
- Add a profile picture of yourself, so that participants will feel welcome and recognize your name upon entering the course. You can find your profile by clicking on your name at the top of the screen and then clicking on 'profile'.
- Respond to questions of course participants.
- Make sure that all course participants enroll in the courses: check the names on the list with the list of participants in the course (if you don't manage the subscriptions to the course, make sure you contact the correct persons).
- Check all assignments in the first two learning units. For the first week this is LU 0 and 1. Make sure everything is working (that there are no technical issues, no attachments are missing, etc.). If you come across any issues, contact the technical staff of the course (Elevate Health or Life Long Learning Platform at UU).

Week 1

- Monday: Place a welcome message on the news forum. In this message, welcome participants to the course, inform them about what they can expect this week (e.g., what is on the program), draw their attention to the live meeting (repeat date and time, and explain how they can access the live meeting), and ask them to check if they can log in before the live meeting so that there is enough time to solve login problems if any arise.

For example: *"Dear all, welcome to the start of this online course! My name is_____, I will be assisting with the moderation of this course so please feel free to contact me with any queries or technical difficulties you may experience via the platform or by email at_____.*

This week you will be working on Learning Units 0 and 1. LU 0 helps you familiarise yourself with the course format and platform as well as the chance to meet the fellow participants in a live meeting. The live meeting will be held tomorrow 12 January from ¿?(CET). You can enter the live meeting through assignment 0.4 by clicking on the 'join session' button. You are asked to have completed your personal profile before the meeting, instructions can be found in assignment 0.4.

Make sure that you have put the date of the onlive meeting for this course in your calendar. You can find the link to participate to the live online meeting in LU0.8.

LU 1 will take a look at RCR in a historical context along with the European code of conduct and the reflection model. You will then have the opportunity to apply this knowledge to a case in assignment 1.4 which can be completed in your portfolio.

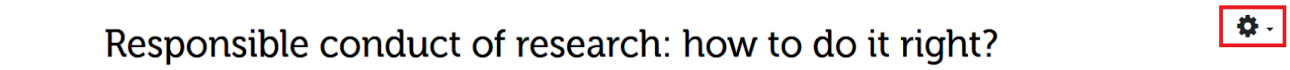
Hope you enjoy the course and find it a useful experience. Good luck! {Name}"

- Highlight that they need to join a collaboration group in assignment 0.8.
- Live meeting. You schedule in advance with the course teacher a live online meeting at the start of the first week. Usually, we schedule this on the second day (Tuesday), to allow everyone time to log in to the course. The course teacher leads the live meeting. The role of the moderator is to ensure a smooth meeting. This involves three main tasks:

    1. Check who is present. If any participants are not present send them an email right away saying that the live meeting has started and that you are still missing them. In the meantime, the course teacher can continue with the meeting.
    2. Make sure everything is going well technically. If there are any technical issues try to solve them or (if this is not possible and there are serious problems) create an alternative meeting (e.g., using Zoom) and send a link to all participants.

3. Assist the course teacher. The course teacher may for example ask you to give information about certain aspects of the course (e.g., about the course contents, course schedule, assignments, etc.).

- Answer questions of course participants or if you cannot answer them, forward them to Elevate or the LLL platform of UU (for technical issues) or to the course teacher (for substantial questions about the course content).
- Keep an eye on what participants post in the course. If they have any questions or experience any issues help them out. Also, if you notice participants are misinterpreting an assignment you should address this. (You do not have to reply substantially; this is the role of the course teacher. If you see any substantial questions that need a reply, notify the course teacher and ask him/her to respond.)
- Check participant progress. To access the participant progress screen, click on the wheel next to the course name, click 'more' and then click 'participant progress'. (see example below)



In the overview that opens you will see all course participants, which activities they have watched (eye symbol) or completed (check symbol) and when they have done this. By the end of the week, contact all participants who have not started with the course yet. Say that you noticed they have not started yet and ask them if they need any help.

- Friday: post an end of the week message on the news forum. In this message summarize the highlights of that week (e.g., insightful contributions of course participants or interesting discussions). Also point out that the deadline for completing LU 0 and 1 is on Monday.
- Check Learning Unit 2. Make sure everything is working (that groups have been made for all group assignments, there are no technical issues, no attachments are missing, etc.). If you come across any issues, contact Elevate.

Week 2

- Monday morning: place a start of the week message on the news forum. In this message give an overview of the week. Let them know that they can contact you if they have any questions.

For example: "Dear all, welcome to week 2 of the course, we hope you're enjoying it so far! The deadline for Learning Unit 0 and 1 is today. This week you will be working on LU 2 with a focus on how to establish mutual expectations and responsibilities in supervision and mentoring and its contribution to the Responsible Conduct of Research (RCR). You can expect to find a discussion assignment, to add to your personal portfolio and to create a mind map.

As always if you have any problems or questions please get in touch. Have a nice week! All the best,"

- Confirm times of live meeting with instructor for assignment 3.2.
- Confirm times for final meeting Week 5 with the instructor.
- Answer questions of course participants.
- Check participant progress.
- Keep an eye on what participants post in the course.
- Friday: post end of the week message. Reminder of live session times.
- Check Learning Unit 3. Make sure everything is working (that there are no technical issues, no attachments are missing, etc.). If you come across any issues, contact Elevate.

Week 3

- Monday morning: place a start of the week message on the news forum. Remind participants of live meeting 3.2. Check wiki 4.2.
- Answer questions of course participants.
- Check participant progress.
- Keep an eye on what participants post in the course.
- Friday: post end of the week message.
- Check Learning Unit 4 and 5. Make sure everything is working (that groups have been made for all group assignments, there are no technical issues, no attachments are missing, etc.). If you come across any issues, contact Elevate.

Week 4

- Monday morning: post a start of the week message. In the message remind participants of the group assignment in 4.2 and to contact group members as soon as possible.

For example: Hi everyone, hope you're enjoying the course so far! This week you will look at collaboration with those outside your research team, focusing on conflicts of interest, ownership and competition. As well as, activities to aid you prepare for your meeting with your supervisor.

There is a group assignment in this learning unit, you can find the groups posted in the previous thread. I would recommend you contact them as soon as possible to allow enough time to complete the assignment, you can do this through the 'My Peers' tab or via the video chat that was used in the introductory session.

Good luck!

- Confirm date/time of plenary feedback session based on meetings with supervisor/mentor
- Answer questions of course participants
- Check participant progress
- Keep an eye on what participants post in the course
- Friday: post end of the course message. Thank everyone for their participation and round things off. Ask them to fill in the evaluation form in LU 5. Give information about when and how they will get their course certificate.
- Ask the course instructor for the deadline for the final completion of activities. Communicate this to the participants
- Certificates can be downloaded automatically after this date by those who the instructor has indicated successfully completed the course. Make sure you check if this is done.
- Discuss with the instructor who will inform the participants of this once it has been indicated and saved on the platform.

Moderator information SPOC 2: Data in research

The course has a course teacher and a moderator. The role of the teacher is to give substantial feedback and to lead the live meetings. The teacher will only be present once in a while to do these tasks. The role of the moderator is to answer questions, post course updates, solve (technical) issues, check participant progress, and in general make sure that the course runs smoothly. The moderator should be present regularly (preferably check at least once a day).

Below, you can find the tasks of the moderator per week.

Week before the course starts

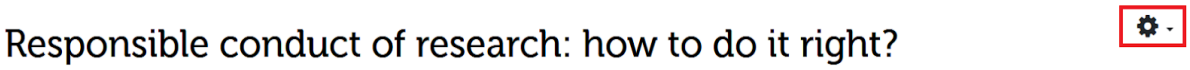
- Send an email with the course information to all course participants at least one week before the course starts. You can use the course information template for this (don't forget to fill in the name of the teacher, name of the moderator, dates, and name at the bottom of the information file).
- Add a profile picture. You can find your profile by clicking on your name at the top of the screen and then clicking on 'profile'.
- Respond to questions of course participants.
- Send a list of course participants (first name, last name, email address) to Elevate or to the person responsible for enrolling students in the course.
- Check Learning Unit 0 and 1. Make sure everything is working (that there are no technical issues, no attachments are missing, etc.). If you come across any issues, contact Elevate.
- Confirm times of office hours with the instructor and the dates for the live meetings (there are three live meetings in this course). Until now, each week we offer office hours for any questions that participants have. they can simply log in and talk to the teacher during this office hour. Only one has made use of this option in all runs of the course so far.

Week 1

- Monday: Place a welcome message on the news forum (see sample mails in 4.1). In this message, welcome participants to the course, inform them about what they can expect this week (e.g., what is on the program) such as group assignment 1.3, ask that they assign themselves to a group as soon as possible.
  Draw their attention to the live meeting (repeat date and time, and explain how they can access the live meeting), and ask them to check if they can log in before the live meeting so that there is enough time to solve login problems if any arise.
- Live meeting: the course teacher leads the live meeting. The role of the moderator is to ensure a smooth meeting. This involves three main tasks:

1. Check who is present. If any participants are not present send them an email right away saying that the live meeting has started and that you are still missing them. In the meantime, the course teacher can continue with the meeting.
2. Make sure everything is going well technically. If there are any technical issues try to solve them or (if this is not possible and there are serious problems) create an alternative meeting (e.g., using Zoom) and send a link to all participants.
3. Assist the course teacher. The course teacher may for example ask you to give information about certain aspects of the course (e.g., about the course contents, course schedule, assignments, etc.).

- Answer questions of course participants or if you cannot answer them, forward them to Elevate or the LLL responsible person (for technical issues) or to the course teacher (for substantial questions about the course content).
- Keep an eye on what participants post in the course. If they have any questions or experience any issues help them out. Also, if you notice participants are misinterpreting an assignment you should address this. (You do not have to reply substantially; this is the role of the course teacher. If you see any substantial questions that need a reply, notify the course teacher and ask him/her to respond.)
- Check participant progress. To access the participant progress screen, click on the wheel next to the course name, click 'more' and then click 'participant progress'. Below you see a sample of one of the SPOCs (the wheel is on the right).



In the overview that opens you will see all course participants, which activities they have watched (eye symbol) or completed (check symbol) and when they have done this. By the end of the week, contact all participants who have not started with the course yet. Say that you noticed they have not started yet and ask them if they need any help.

- Friday: post an end of the week message of the news forum. In this message summarize the highlights of that week (e.g., insightful contributions of course participants or interesting discussions). Also point out that the deadline for completing LU 0 and 1 is on Monday.
- Check Learning Unit 2. Make sure everything is working (**that groups have been made for all group assignments,** there are no technical issues, no attachments are missing, etc.). If you come across any issues, contact Elevate.

Week 2

- Monday morning: place a start of the week message on the news forum. In this message give an overview of the week. Let them know that they can contact you if they have any questions.
  They will be looking at LU 2 & 3. Remind them of optional office hours in 3.3, the group assignment 3.1 in which they will use the same groups as 1.3 and that there is a plenary session to discuss the group work. (date/time info in course information leaflet)
- Answer questions of course participants.
- Check participant progress.
- Keep an eye on what participants post in the course.
- **Friday: post end of the week message.**
- Check Learning Unit 4,5,6. Make sure everything is working (that there are no technical issues, no attachments are missing, etc.). If you come across any issues, contact Elevate.

Week 3

- Monday morning: place a start of the week message on the news forum. **Add a feedback case.** *Direct participant attention to the peer review activity and explain how this will work.*
- Answer questions of course participants.
- Check participant progress.
- Keep an eye on what participants post in the course.
- Friday: post end of the course message. Thank everyone for their participation and round things off. Ask them to fill in the evaluation form in LU 6. Give information about when and how they will get their course certificate.
- *Ask the course instructor for the deadline for the final completion of activities. Communicate this to the participants*
- *Certificates can be downloaded automatically after this date by those who the instructor has indicated successfully completed the course.*
- *Discuss with the instructor who will inform the participants of this once it has been indicated and saved on the platform.*

Moderator Information SPOC 3: Integrity in Academic Publication: Authorship and Peer Review

The course has a course teacher and a moderator. The role of the teacher is to give substantial feedback and to lead the live meetings. The teacher will only be present once in a while to do these tasks. The role of the moderator is to answer questions, post course updates, solve (technical) issues, check participant progress, and in general make sure that the course runs smoothly. The moderator should be present regularly (preferably check at least once a day).

Below, you can find the tasks of the moderator per week.

Week before the course starts

- *Confirmation of subscription emails ??*
- Send an email with the course information to all course participants at least one week before the course starts. You can use the course information template for this (don't forget to fill in the name of the teacher, name of the moderator, dates, and name at the bottom of the information file).
- Add a profile picture. You can find your profile by clicking on your name at the top of the screen and then clicking on 'profile'.
- Respond to questions of course participants.
- Send a list of course participants (first name, last name, email address) to Elevate.
- Check Learning Unit 0 and 1. Make sure everything is working (that there are no technical issues, no attachments are missing, etc.). If you come across any issues, contact Elevate or the LLL responsible person.

Week 1

- Monday: Place a welcome message on the news forum. In this message, welcome participants to the course, inform them about what they can expect this week (e.g., what is on the program), to assign themselves to a collaboration group in 0.6 and the collaborative task in 1.4. (see sample mail in 4.1)
  Draw their attention to the live meeting (repeat date and time, and explain how they can access the live meeting), and ask them to check if they can log in before the live meeting so that there is enough time to solve login problems if any arise.
- Live meeting: the course teacher leads the live meeting. The role of the moderator is to ensure a smooth meeting. This involves three main tasks:
  1. Check who is present. If any participants are not present send them an email right away saying that the live meeting has started and that you are still missing them. In the meantime, the course teacher can continue with the meeting.

2. Make sure everything is going well technically. If there are any technical issues try to solve them or (if this is not possible and there are serious problems) create an alternative meeting (e.g., using Zoom) and send a link to all participants.
3. Assist the course teacher. The course teacher may for example ask you to give information about certain aspects of the course (e.g., about the course contents, course schedule, assignments, etc.).

- Answer questions of course participants or if you cannot answer them, forward them to Elevate (for technical issues) or to the course teacher (for substantial questions about the course content).
- Keep an eye on what participants post in the course. If they have any questions or experience any issues help them out. Also, if you notice participants are misinterpreting an assignment you should address this. (You do not have to reply substantially; this is the role of the course teacher. If you see any substantial questions that need a reply, notify the course teacher and ask him/her to respond.)
- Check participant progress. To access the participant progress screen, click on the wheel next to the course name, click 'more' and then click 'participant progress'.

Responsible conduct of research: how to do it right?

In the overview that opens you will see all course participants, which activities they have watched (eye symbol) or completed (check symbol) and when they have done this. By the end of the week, contact all participants who have not started with the course yet. Say that you noticed they have not started yet and ask them if they need any help.

- Check Learning Unit 2. Make sure everything is working (that groups have been made for all group assignments, there are no technical issues, no attachments are missing, etc.). If you come across any issues, contact Elevate.

Week 2

- Monday morning: place a start of the week message on the news forum. In this message give an overview of the week. Also point out that there is a group assignment this week in 2.4, encourage participants to contact their group members timely so that they have enough time to complete the assignments. There is also a live meeting in relation to this assignment in 2.7, remind them of the date and time as is in the course information. Let them know that they can contact you if they have any questions.
- Answer questions of course participants.
- Check participant progress.
- Keep an eye on what participants post in the course.

- **Friday: post end of the week message.**
- Check Learning Unit 3 and 4. Make sure everything is working (that there are no technical issues, no attachments are missing, etc.). If you come across any issues, contact Elevate.

Week 3

- Monday morning: place a start of the week message on the news forum. Highlight what will be discussed this week and the group assignment in 3.6.
- Answer questions of course participants.
- Check participant progress.
- Keep an eye on what participants post in the course.
- Friday: post end of the course message. Thank everyone for their participation and round things off. Ask them to fill in the evaluation form in LU 4. Give information about when and how they will get their course certificate.
- Ask the course instructor for the deadline for the final completion of activities. Communicate this to the participants
- Certificates can be downloaded automatically after this date by those who the instructor has indicated successfully completed the course.
- Discuss with the instructor who will inform the participants of this once it has been indicated and saved on the platform.

Teacher activities in a SPOC

Courses need teachers. In SPOCs, however, the teacher-team of Integrity has already done quite a bit in the design and development of the course. Participants can go through the course materials with a lot of independence, yet at times the teacher is still highly relevant. In these SPOCs, teachers are there to welcome students (together with the moderator if there is a separate moderator) in an online live meeting, and also in the course environment; to guide the students to the assignments and give feedback. You can take a minimum amount of time to spend in the courses, focusing on core assignments that at least need to be done and leave many discussions to the students themselves (you can also be explicit in what they can expect from you as a teacher in the course), or you can be very engaged and read all discussions and provide feedback where you feel it is relevant and necessary. Different from the moderator, the teacher is expected to have sufficient knowledge of debates on research integrity, and able to provide some background information.

For each of the three SPOCs developed, we have described in the sections below what you can expect content wise as teacher and what you can add. Also, look in the appendix for a schematic overview of each SPOC.

Teacher activities in SPOC 1: RCR through supervision and mentoring and collaboration

As stated earlier, each learning unit in this course has a number of activities prepared, that students are expected to read/write/discuss. The icons at the beginning of each activity indicate what type of activity is planned. The students are stimulated to be active together, and form a group of participants that also 'know' each other. Therefore, in the first week, we always schedule an online live meeting, where we mainly get acquainted and inquire about the motivations and expectations of participants and ask if there are any questions. This usually works well, especially if the participants did not know each other before the course (we piloted with international groups of PhD students).

The course outline of this course looks like this: The first week participants see the course materials of LU 0 and LU.

Week 1: Lu 0 + 1

In learning unit 0, participants will find 6 activities that help them to get acquainted with the course: a short welcome with the picture of the course structure (as shown above), information about the ground rules of the course and consent to use in course data (0.2), an introduction movie to get acquainted with the course environment in 0.3, the joint live meeting and introduction section in 0.4, an assignment in 0.5 and an instruction for a course-long assignment. With regards to the assignments:

0.5 - Each course starts and ends with the specific learning aims that we defined for the course. We put it in an assignment and ask students for each learning aim if that is also relevant to them (on a Likert scale). At the end of the course, we return to the same learning aims and ask them if they have changed their mind on the relevance to them of these learning aims. THe advantage is that it helps to explain what they can expect from the course, but also to check what expectations participants have themselves.

0.6 - The course has an assignment that continues in the weeks. As part of becoming more empowered, the task is to have a meeting with one's supervisor(s) during the course on topics that are RCR related. Quite often, PhD candidates do not discuss much issues of authorship, data management, daily life RCR issues etc. We invite them to think about such issues, collect these during the assignments in the weeks and actually address these in a conversation. in 0.6 we introduce the assignment and offer some help (a default mail that they can use). In the final live online meeting we ask to report back on their talk with the supervisor. Usually

they are quite positive about it, and it opened up interesting discussions with their supervisor.

LU 1: Introduction to responsible conduct of research

This learning unit is also introductory and has a lot of overlap with the other SPOCs we developed: each SPOC has a short video on the history of RCR (1.2), has a unit on the European Code of Conduct (1.3) and stimulates participants to have case discussions based on a reflection mode (1.4). In this SPOC, we have put this in LU 1. At the end of a week (in this case, LU 1), we ask how much time they have spent, in order to keep track of student activities. A teacher can see the participant activity in a specific frame, using the 'wheel' at the upper right side of the course.

Feedback:

0.3 - participants used the discussion forum. You can give feedback to their contributions on the case discussion. Notice that if you help them early on in the course to do this right (how to have a case discussion), it will be helfpul to participants later on in the course.

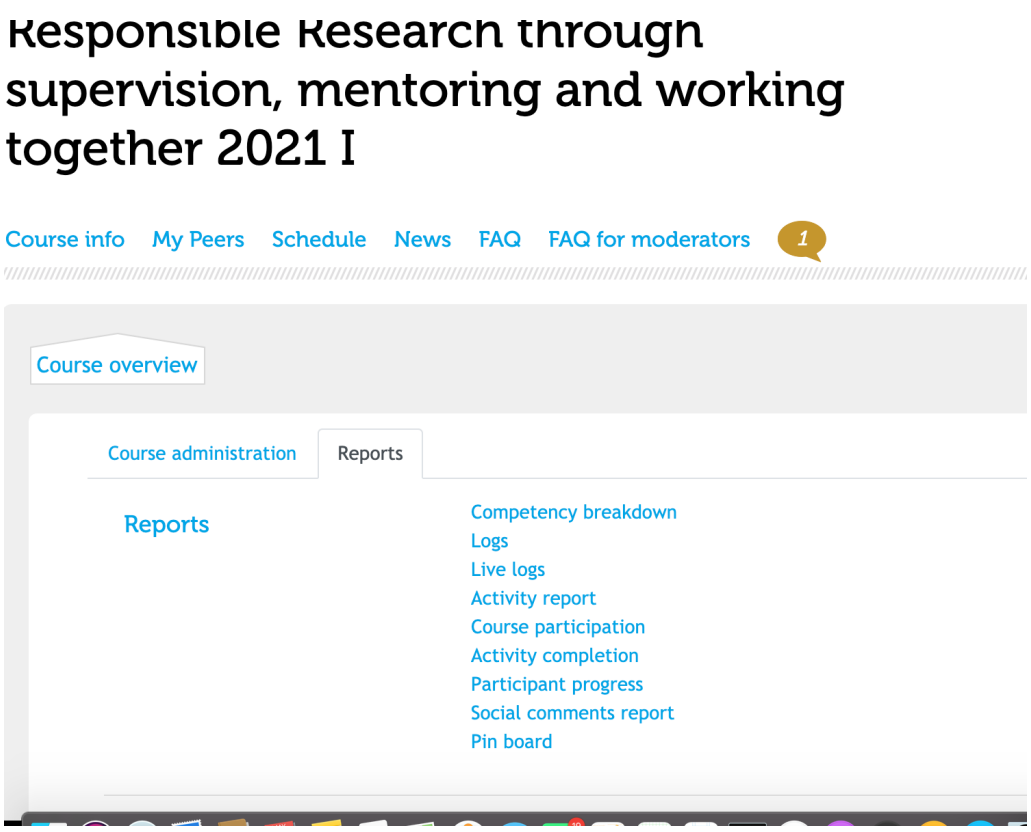
0.4 - the RCR reflection model is also introduced (a short video and a pdf file). next, participants need to use the portfolio (which is an individual assignment that is only visible to the participant and the teacher). You can give individual feedback. How? click on the portfolio assignment, and you can select students' contributions. In a text box you can give feedback. This is usually appreciated highly. Also, students cannot always complete these activities themselves. NB: so far, we have not graded with marks, but simply gave feedback and clicked 'completed'. It seems a bit odd to give grades on these case reflections for such advanced students. You can choose to do otherwise.

NB the RCR reflection model is a model that derives from a tradition of moral case deliberations. It is a structured manner to discuss issues that require deliberation and not only helps to unravel what are relevant considerations, but also helps to navigate towards a decision and possible action. In this specific model, we steer participants to the code of conduct to find help to formulate relevant considerations, but also ask them to think what strategies they can use to deal with the issue and who can be of help. It is highly relevant to know that one is not on one's own if one encounters an RI issue in practice.

For teachers it is good to know that a case illustration is available in the course environment (as pfd file).

How to see if students have been active?

Participant activities: Click on the 'wheel', on 'more' and the page will open. Click on the tab 'report' and you can see who has been active (either use 'activity completion' or 'participant progress')

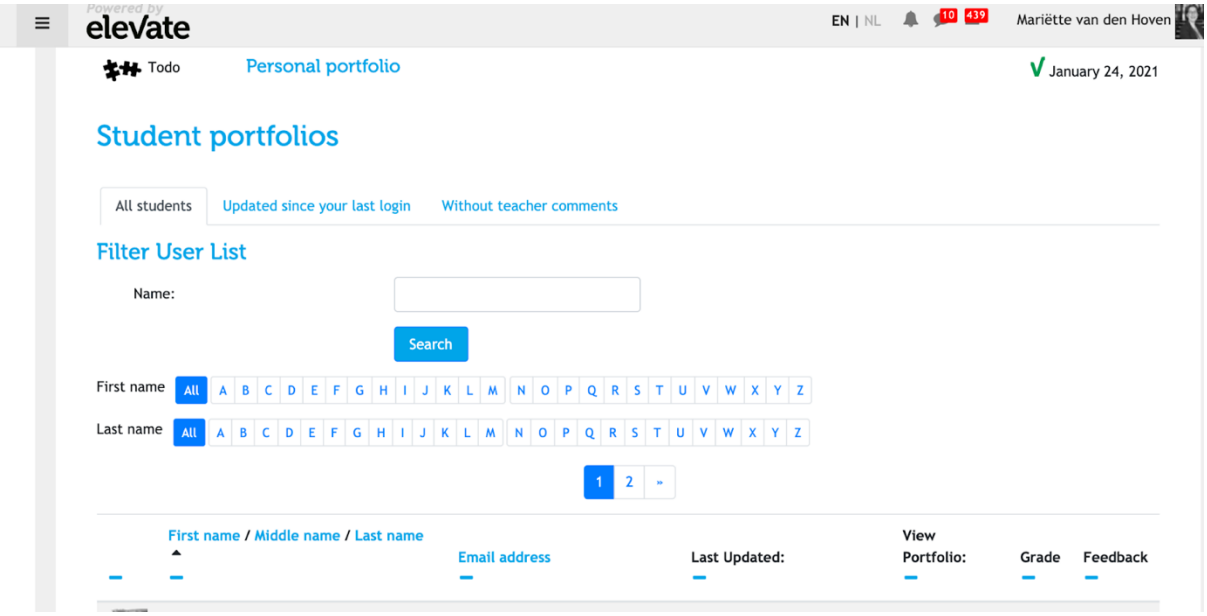


Week 2: LU 2 about expectations and responsibilities in supervision and mentoring

This week, we focus on the mentoring and supervision relation specifically, in seven activities. LU2.11 introduces the topic, and in 2.1.2 participants can read more on a number of items what RCR issues in supervision and mentoring can consist of (this is not a final list, but this derives from the literature). Via dropdown menus, they can read about 11 topics. We ask them to use the discussion section to say something about the issues. 2.2 focuses on styles of supervision and mentoring, where we use some cartoons that (exaggerate) roles that a supervisor can take. 2.3 is a portfolio assignment where participants write down their own expectations of their supervisor and and vice versa. 2.4 focuses on responsibilities and uses a list of commonly mentioned responsibilities. 2.5 focuses on power relations and in 2.6 we take stock of what is learned in the LU 2.

Many of the assignments in this LU are mainly meant to stimulate reflection among individual participants. It is not necessary to react on all issues, but it is good to have a look at the portfolio's and see if some participants struggle with issues that you might offer some support (some might have experienced nasty situations for example).

How to enter the portfolios: click on the assignment or go directly to the bottom of the course overview (tab portfolio's). You can choose 'student portfolios': if you click there, the names will appear and if they have finished the assignment (see below)



Week 3: LU 3 on Culture, colleagues and communication

This week, we zoom out on working with others next to a supervisor. In many research practices, research is teamwork, and there are often many more junior and senior colleagues that one has to deal with. In LU 3 you find 6 assignments, of which an introduction (3.1), a live meeting on key values in research practices (second live meeting in 3.2), a discussion on a case (3.3), on communication (3.4) and taking stock.

In the live meeting (3.2) , the teacher takes the lead. It helps to prepare a few questions that are related to values in research practice (you can use the code of conduct, but you can also ask the simple question 'what seems an implicit norm in your research group and how do you feel about this'? (it could be on anything, like 'being open to each other'(positive), or 'that we always work at least twice the hours (not always positive). This often is a helpful question. Close with some suggestions on how to improve research cultures.

3.3 Is a case discussion where participants have to use the RCR reflection model. It is of importance that you offer feedback at the end of the week (or beginning next week) on the assignment. See if all steps have been taken, if they have been able to come to a conclusion, if they missed important insights. Always comment in a positive manner, stimulating them to open up on these cases, to learn to take other perspectives as well and learn how to develop strategies on how to deal with RI issues in practice.

Week 4: LU 4: Collaboration outside the team

In this LU we broaden the scope even more, inquiring how to work with stakeholders. Often, conflicts of interests can occur, or different expectations. How to deal with these? The LU consists of 5 assignments: an introduction (4.1), a group assignment on conflicts of interests (4.2), a portfolio assignment on competing responsibilities (4.3), a video and discussion on intellectual property (4.4) and a final preparation for the conversation with the supervisor (4.5).

Feedback: provide feedback on the group assignment (4.2) and have a look at the portfolio: are participants still active, or do they need a bit of encouragement.

Week 5: final week: learning to take responsibility and its boundaries

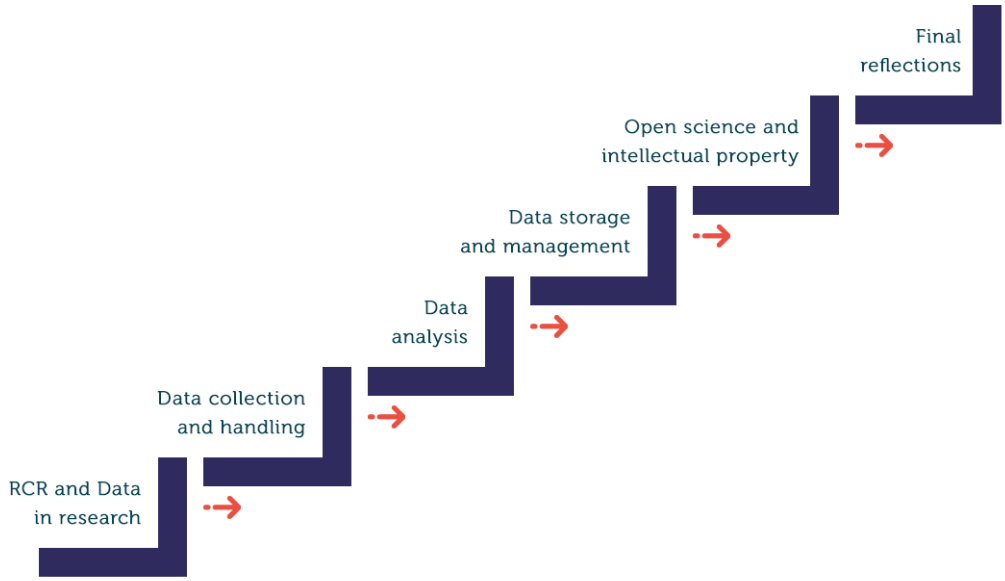
This final week is about bringing things together. In 5 assignments, we indicate the conversation with the supervisor once again (5.1 and 5.2), a final online live meeting where participants report back how the conversation was (5.3) and final evaluations (5.4 and 5.5). We usually require that they finish also 5.5 (reflections) before they will receive a course certificate.

How to decide who will be credited with a course certificate. Usually, not all participants will have completed the full course, so a minimum threshold needs to be set. This can differ and it is up to the teacher to decide. You manually check the boxes in the course activity center and you click on the box 'certificate' (don't forget to save your decision). Also check carefully if your changes are changed before you send a final message to the students.

<u>Sending messages to students:</u>

1. You can collectively post items via the 'news' button in the upper menu. Announcements will be posted to all course participants. Make sure that the mails will not end up in your junk mail!
2. You can directly mail participants individually via the 'my peers' button. Participants can also contact each other using this button.

Teacher activities in SPOC 2: Data in research



Week 1

In the first week, course participants work on Learning Unit (LU) 0 and 1, in which they will get familiar with the course environment and are introduced to the Responsible Conduct of Research (RCR). There is a live meeting at the beginning of the week (Learning Activity (LA) 0.4) in which participants introduce themselves and get to know each other and the course teacher and moderator. Participants also have to complete a group assignment (LA 1.3). The course moderator will remind participants of the live meeting and assignment.

Learning Unit 0: Introduction to the course

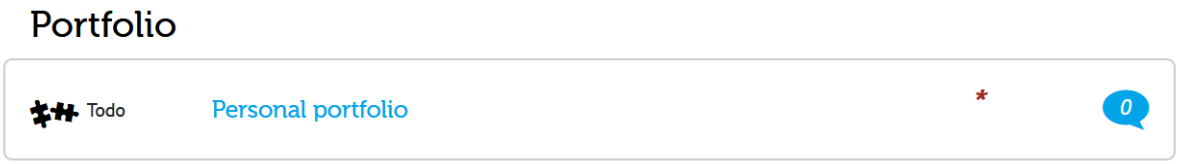
Overview: In this LU, participants explore the learning environment (LA 0.3) and join a group for the group assignments (LA 0.5). They also reflect on their personal learning aims (LA 0.7) and are introduced to the history of RCR (LA 0.8) and the ALLEA code of conduct (LA 0.9). At the end of the LU, participants make their first portfolio assignment.

Teacher tasks:

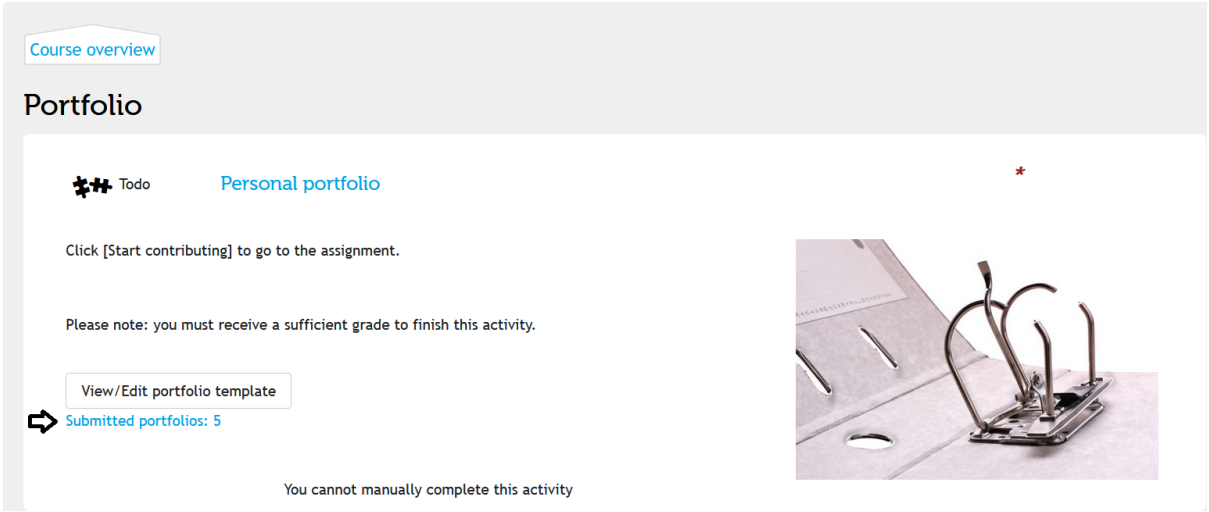
- As the course teacher, you will lead the **live session**. To enter the live meeting, go to LA 0.4 and click 'join session'. The goals of this meeting are:
    - The course teacher and moderator introduce themselves and explain how course participants can contact them.

- Course participants introduce themselves to the group (name, country, research topic, motivation for following the course).
- The course teacher gives information about the course (e.g., the course structure and how to work together in groups and contact group members).
- Participants can ask any questions they may have.

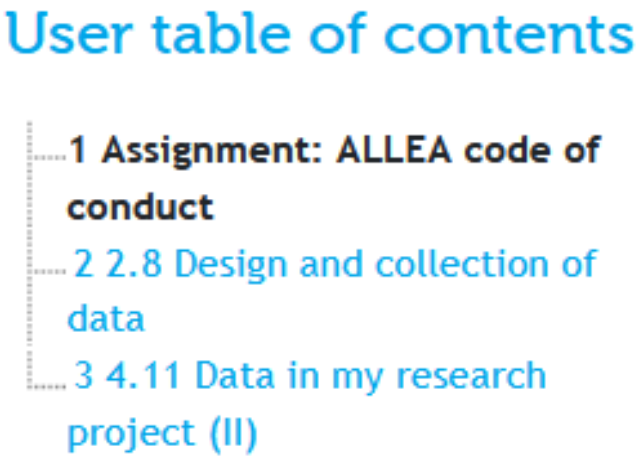
- In LA 0.9, participants make their first **portfolio assignment**. For this assignment, participants have to read the ALLEA Code of Conduct and choose one principle that applies to their research project in a positive way (i.e., something that goes right) and one principle that they are struggling with in their project or that needs attention. You can give feedback on each portfolio assignment separately or on the entire portfolio at once at the end of the course. To give feedback on portfolio assignments, scroll to the bottom of the page and click on 'Personal portfolio'.



On the page that opens, click on 'submitted portfolios'.

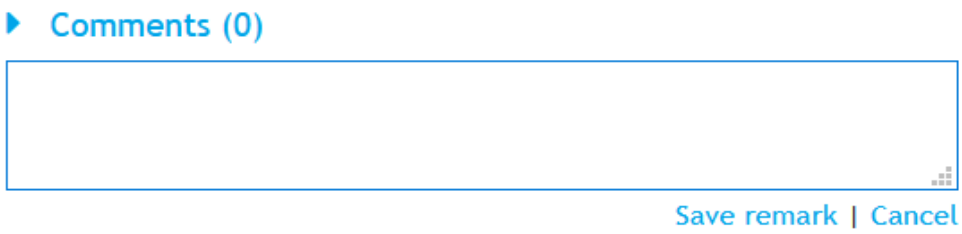


You will now see a list of course participants that shows their progress on the portfolio assignments. To view a students' portfolio assignment, click on 'view' in the 'view portfolio' column. You will now see their first portfolio assignment. You can also see their other portfolio assignments, by clicking on them in the user table of contents on the right side of the page.



To give a student feedback, use one of the following three methods:

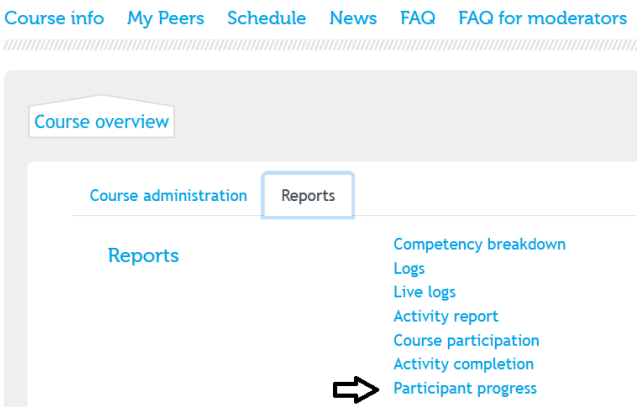
- **General feedback with a grade:** go to the student portfolio overview (using the instructions above). In the 'view portfolio' column click on 'grade'. Select a grade, give feedback, and click on 'save changes'.
- **General feedback without grading:** choose a student portfolio to view (using the instructions above). At the bottom of the page, add a comment with your feedback and click 'save remark'.



- **Detailed (in-text) feedback:** choose a student portfolio to view (using the instructions above). At the bottom of the page (just above the comments section) download their uploaded file (if they added text in the portfolio itself rather than uploading a separate file, instead copy their answer to a Word file). You can now add comments to specific parts of their assignment. When finished, send your feedback through email. You can find participants' email addresses through the participant progress screen (see below).

- The course moderator will check **participant progress** and contact inactive students. However, as a teacher you may still be interested in the progress of your students. To go to the participant progress screen, click on the wheel to the right of the course title, and click 'more' in the menu that opens.

  Go to the reports tab and click 'participant progress'.



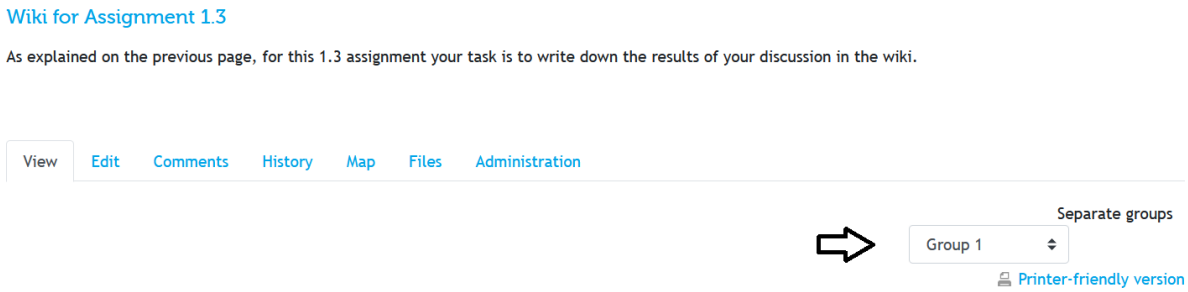
In the table that opens, you will find participants' names and email addresses as well as information on when they last accessed the course and what LA they last completed. If you scroll to the right, you will see an overview of all LA's. For each LA, you can see if the participant viewed it (eye icon) or completed it (check icon).

Learning Unit 1: RCR and data in research

Overview: In the first LU, participants learn about the research cycle (LA 1.1) and are introduced to the RCR Reflection Model (LA 1.2). The RCR Reflection Model was developed in the H2020 Integrity project to help students reflect on integrity dilemmas. The model consists of four steps (explore the context, analyze, balance/decide, and conclude/act). For each of these steps, course participants go through a series of questions that help them reflect and work towards a conclusion. After learning about this model, participants will practice applying it to a case in groups (LA 1.3).

Teacher tasks:

- To view the completed **group assignments**, go to LA 1.3.2 and select a group.



  Optional: If you would like to give feedback on an assignment, go to the Comments tab and click 'add comment'.

- Friday: post an **end of the week message** in the news forum. You can do this by clicking the News tab and then clicking 'add topic'.

  In this message summarize the highlights of that week (e.g., insightful contributions of course participants or interesting discussions). Also, remind participants of the deadline for completing LU 0 and 1 (i.e., the deadline that you added in the course information file; this is usually the last day of the week (Sunday) or the first day of the second week (Monday)).

Week 2

In the second week, participants work on the second and third LU, focussing on data collection, handling and analysis. They will analyze a case in groups (LA 3.1) and present it during the second live meeting of the course (LA 3.2).

Learning Unit 2: Data collection and handling

Overview: In the second LU, students will learn about the GDPR regulations (LA 2.2) and apply them to a case (LA 2.3). They will also study the principles and considerations that are important in ethics review (LA 2.4), respond to statements about the ethics of data collection (LA 2.5), read articles on the ethics of big data (LA 2.6), and learn about data books (LA 2.7).

At the end of this LU, participants make their second portfolio assignment.

Teacher tasks:

- In LA 2.3, participants discuss a case. After adding a contribution, they will gain access to a feedback file that contains general feedback for each of the cases. Thus, giving feedback on this assignment is not necessary, unless a student has a specific question that is not addressed in the general feedback file.
- In the second portfolio assignment (LA 2.8), students consider several aspects of data collection and handling, and indicate for each of these aspects whether/how it applies to their own project, what issues could arise, and what strategy they could use to address these issues. To give feedback on this assignment, follow the steps explained in the section on LU 0.

Learning Unit 3: Data analysis

Overview: In the third Learning Unit, participants analyze a case in groups using the RCR reflection model (LA 3.1). They will present their analysis in the second live meeting of the course (LA 3.2).

Teacher tasks:

- The teacher leads the **second live meeting**. To enter the live meeting, go to LA 3.2 and click 'join session'. The goal of this live meeting is to let student groups present their case analysis (this should take about 5 minutes), and then have a 10-minute discussion based on their presentation. You can do the time management yourself, or ask the course moderator to assist with this.
- Friday: post an end of the week message in the news forum (for instructions, see the explanation in the section on LU 1).

Week 3

In this last week of the course, participants will finish the remaining LUs (4, 5, and 6). They will complete their portfolio (LA 4.11) and give and receive peer feedback on the portfolio assignments (LA 5.00). The course ends with a course reflection and evaluation (LA 6.2).

Learning Unit 4: Data storage and management

Overview: In the fourth LU, participants learn the basics of writing a Data Management Plan (DMP). Each LA addresses a question that participants need to consider when writing their DMP and offers information and exercises that help students answer that question. At the

end of the LU, students make their third and final portfolio assignment (LA 4.11).

Teacher tasks:

- The third portfolio assignment is similar to the second portfolio assignment; students fill in a table with several aspects of data storage and management, connecting them to their own research and reflecting on potential issues and strategies. To give feedback on this assignment, follow the steps explained in the section on LU 0.

Learning Unit 5: Open science and intellectual property

Overview: In LU 5, students give and receive peer feedback on the portfolio assignments (LA 5.0), reflect on the open science movement (LA 5.1), consider the implications of the replication crisis for their research (LA 5.2), and are introduced to intellectual property and different licences (LA 5.3) and discuss a case related to this topic (LA 5.4).

Teacher tasks:

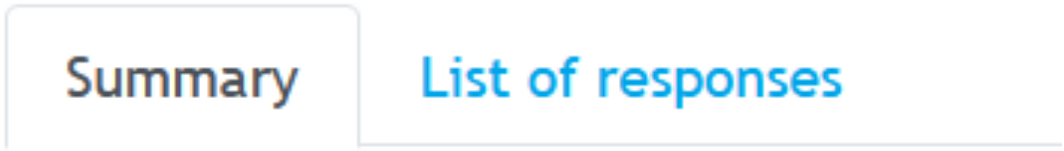
- If you would like to view the **peer feedback** that students give each other on their portfolios, go to LA 5.0, scroll down to the header 'submissions you can assess' and click on the title of a submission. In the page that opens, you can see both the submission and the feedback given by peers.
- Keep an eye on LA 5.4, to see if students have any questions or need clarification while discussing intellectual property.

Learning Unit 6: Final reflections and farewell

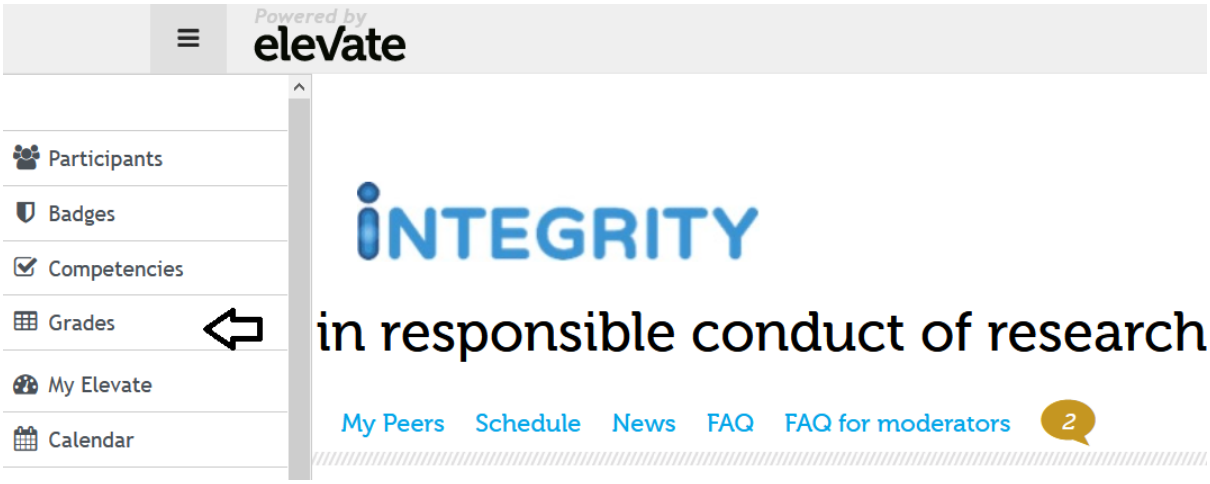
Overview: In the last LU, participants fill in the course reflection and evaluation (LA 6.2). They can also download their course certificate (LA 6.3) after you have indicated that they earned it.

Teacher tasks:

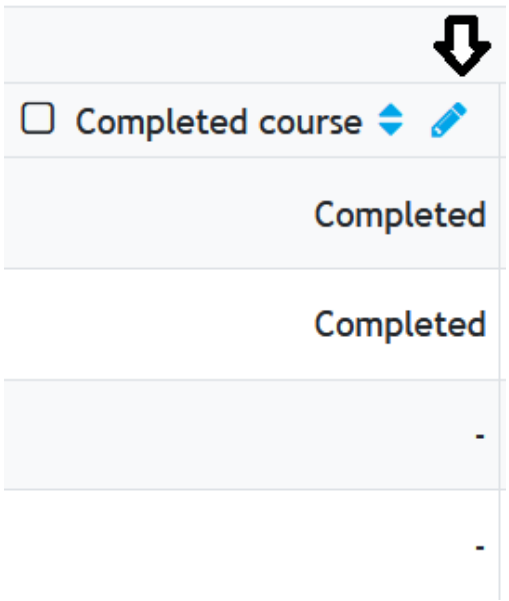
- The course moderator will ask participants to fill in the **course reflection and evaluation**. To see how students evaluated the course, go to LA 6.2 and click 'view all responses'. You can view either a summary of all responses or individual responses separately by switching between the tabs.



- Discuss with the course moderator when you will check the **certificates**, so that he/she can inform the students about the final deadline for completing the course activities. Indicate who has earned a course certificate in the grade centre. You can access the grade centre by clicking the menu button top left of the screen and then clicking ‘grades’.



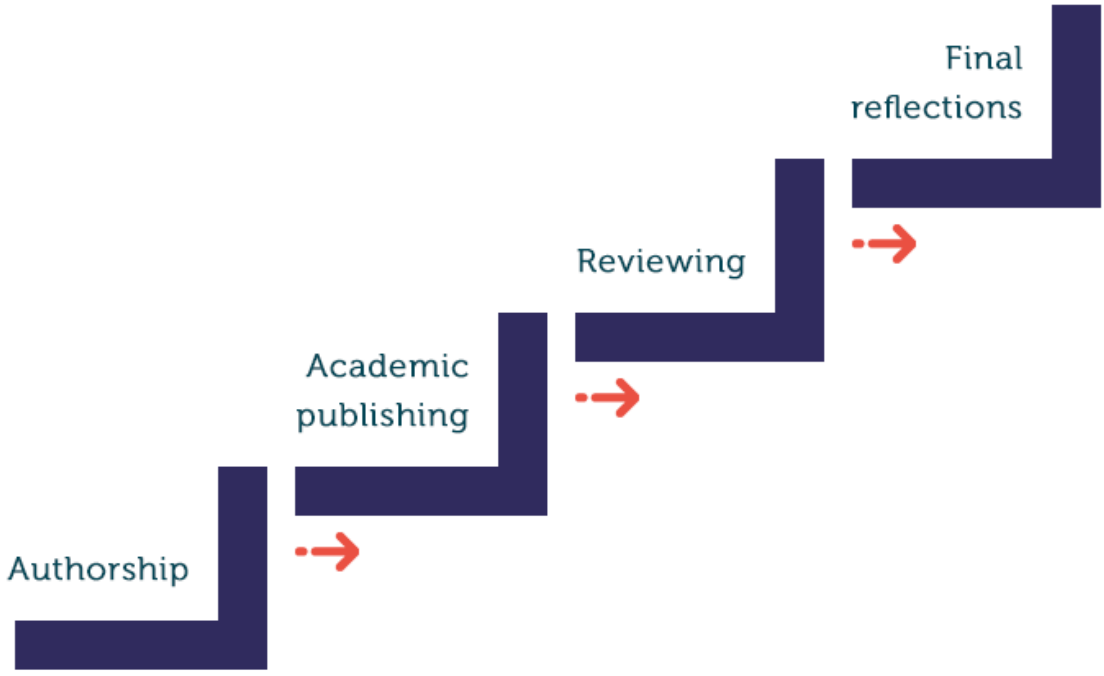
On the page that opens, you will find a table with course participants and several course activities. Scroll to the right, until you find a column named ‘completed course’ at the end of the table. Click on the pencil icon.



Use the dropdown menu next to each student's name to indicate who has completed the course. **Important**: don't forget to click 'save' (at the bottom of the page) when you are finished. Students with a 'completed' grade can now download their course certificate in the course environment.

Teacher activities in SPOC 3: Integrity in Academic Publication: Authorship and Peer Review

This course aims to create awareness of relevant issues in students' academic publishing practice and offer ways to approach them. The course engages PhD's in meaningful discussions to develop insights that can help them in their daily publication practices. LU 1 focuses on how to tackle authorship issues in one's research project. Then LU 2 takes a slightly broader perspective and discusses issues that participants may come across when they are ready to publish a paper, like predatory journals or retracted papers. LU 3 offers practical assignments in which participants further explore what it takes to do a scrupulous and honest review. The image below is taken from the course environment and shows the structure of SPOC 3.



LU 0: Introduction to the course

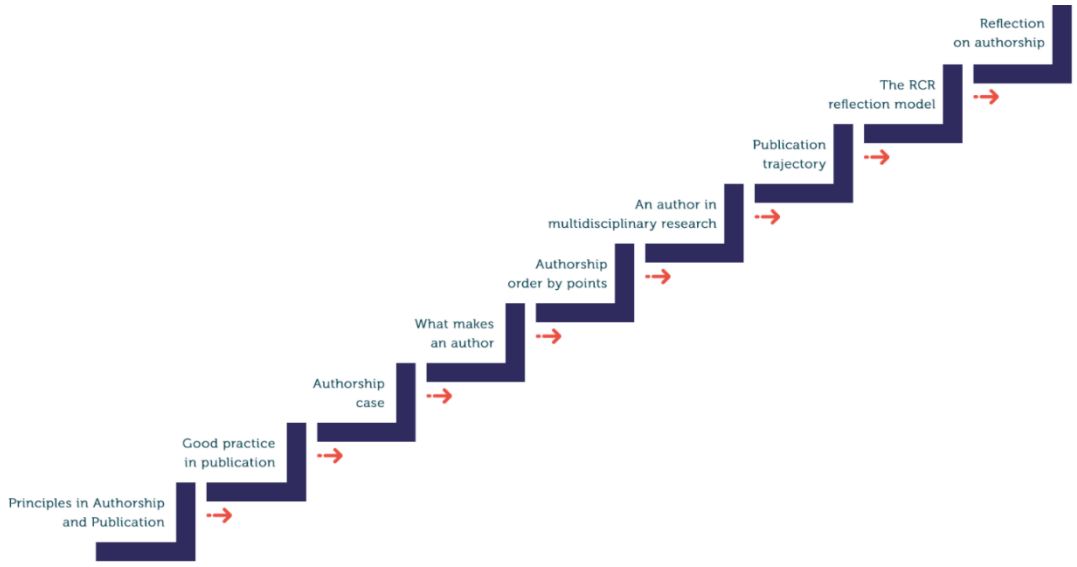
LU 0 and LU 1 are covered in the first week of the course. Participants can access LU 0 a few days before the start of the course to check if they can login the course with their email and

password and to get acquainted with the course environment. The moderator announces the first live meeting that can be accessed via LU 0.4. This meeting is important for participants to get to know each other and aims to improve their sense of belonging to a collaborative learning environment.

- LU 0.4: In this live meeting you welcome everyone and ask all participants to introduce themselves, including their research domain, in what phase of their PhD trajectory they are, and why they are motivated to follow and finish the course. Participants may ask questions about technical aspects of the course. You can address them here or refer participants to the technical moderator.
- It is important in this live meeting to stress our positive RCR approach to Integrity issues as presented in chapter 2 of this manual and shortly explain the course rules (LU 0.2.1). You ask participants to plan their activities at the start of each week and to begin with assigning oneself to a group in LU 0.6.
- To collaborate in groups, students have to find each other and make arrangements for group work. The live meeting button of LU 0.4 is always available for participants to meet online during the course. Participants can email each other or they can communicate/post reactions in the course environment.
- Not all participants will have joined the online meeting. Post a new post under the News tab in which you summarise the most important items discussed in the live meeting and ask all participants to assign oneself to a group in LU 0.6.
- The deadline for LU 0 and LU1 is the monday at the start of the second week

LU 1 on Authorship

In this learning unit, we focus on integrity aspects of academic authorship. We introduce the ALLEA code of conduct as a starting point to explore what being an author of a published paper entails. For most PhD candidates who will compose a thesis out of published articles, co-authorship can be a real and challenging issue to deal with. Sometimes it is already decided

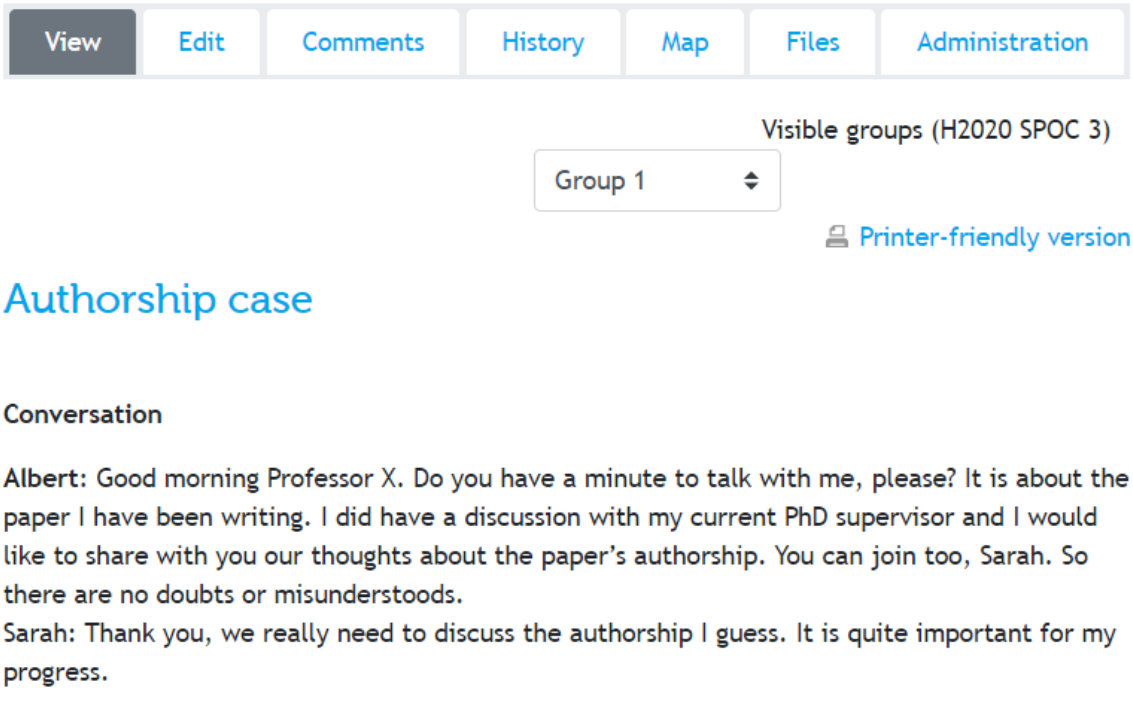


beforehand who will be author of articles to be published in a specified journal, but it may also still be open for discussion. Participants are stimulated to take initiative in authorship discussions and devise a strategy for dealing with possible dilemmas that could arise.

With regard to the assignments

Lu 1.3 - Participants post a discussion topic in which they share an experience around authorship or publication and describe what values from the European Code of Conduct apply. Participants are asked to react on each other. As a teacher you can check if every participant has received a reaction. If not, you can post one. You can thank the participant for the contribution and ask for elaboration or clarification, or describe how one could act in such a case.

LU 1.4 - In this LU, each group finishes the story on authorship that is presented in this LU. You can read the story of all the groups by clicking on the small arrows (see below behind Group 1). You don't have to provide feedback on the story's as in LU 1.10 all participants are asked to reflect on the story of another group. To be able to provide feedback in Lu 1.10, it is important that all the groups finish this assignment before the end of the week. The moderator will check this.

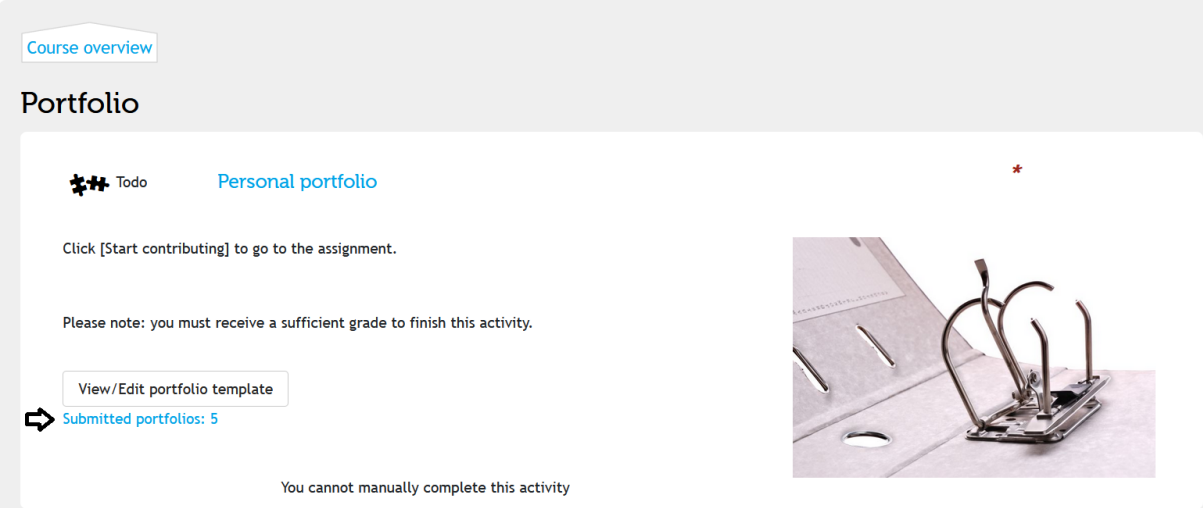


It is important that all the groups finish this assignment before the end of the week as in LU 1.10 all participants are asked to reflect on the story of another group. The moderator will check this.

LU 1.6 - Participants are asked to divide points as to determine authorship order and explain their answer. Also they are asked to assess each others answer. As a teacher you can check if all participants have received feedback by one of their peers. If not, you can provide feedback instead. You may ask whether this system would work in the participants institute and why (not)? What possible benefits or challenges are foreseen about the point system or ask for a better alternative?

LU 1.7 - This is a portfolio assignment.

How to enter the portfolios: click on the assignment or go directly to the bottom of the course overview (tab portfolio's). You can choose 'student portfolios': if you click there, the names will appear and if they have finished the assignment (see below)



In this assignment students explore specific guidelines for determining authorship in their research domain. LU 2.6 will elaborate on this assignment by writing a publication strategy for their PhD trajectory. So, if no questions are asked, no teacher feedback is needed here. You may want to select some good examples of this LU to include in a general email to all participants, for instance to stimulate them to concretely describe the authorship criteria of the journals they selected and comparethem with the criteria of ICMJE or the McNutt criteria. If they cannot find authorship criteria you may stimulate them to further explore what authorship criteria may be applicable in their domain, e.g. by asking colleagues or other participants in the course environment.

In LU 1.7 students explore specific guidelines for determining authorship in their research domain. LU 2.6 will elaborate on this assignment by writing a publication strategy for their PhD trajectory. So, if no questions are asked, no teacher feedback is needed here. You may want to select some good examples of this LU to include in a general email to all participants, for instance to stimulate them to concretely describe the authorship criteria of the journals

they selected and comparethem with the criteria of ICMJE or the McNutt criteria. If they cannot find authorship criteria you may stimulate them to further explore what authorship criteria may be applicable in their domain, e.g. by asking colleagues or other participants in the course environment.

LU 1.9 - the RCR reflection model is introduced here in a short video and a pdf file.

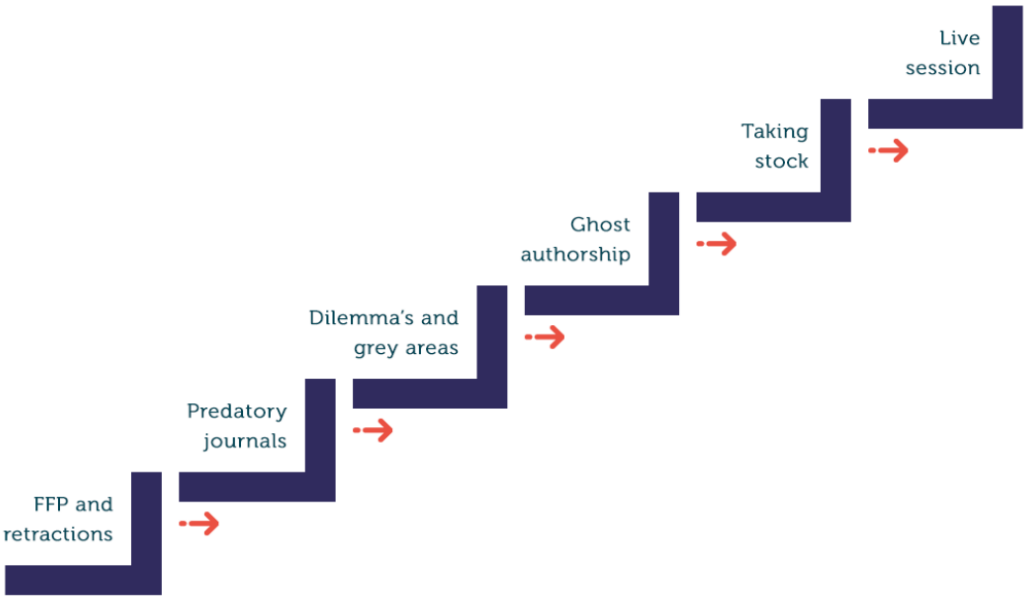
NB the RCR reflection model is a model that derives from a tradition of moral case deliberations. It is a structured manner to discuss issues that require deliberation and not only helps to unravel what are relevant considerations, but also helps to navigate towards a decision and possible action. In this specific model, we steer participants to the code of conduct to find help to formulate relevant considerations, but also ask them to think what strategies they can use to deal with the issue and who can be of help. It is highly relevant to know that one is not on one's own if one encounters an RI issue in practice.

LU 1.10 - participants are asked to read the conversation on authorship that another group produced in LU 1.4.2. They use the RCR Reflection Model, presented in LU 1.8 to individually formulate answers to the questions posed in the model and post them as a reply to the conversation in the discussion section in LU 1.4.2. This means that you can go back to LU 4.2 and read one or two conversations and two or three reactions based on the RCR model. As most partipants will post their reflections at the end of the week, you can take some good examples from the RCR model and post them in a general mail to all participants on Friday:

Thursday /Friday: post an end of the week message in the news forum. In this message summarize the highlights of that week (e.g., insightful contributions of course participants or interesting discussions). Also you may point out that the deadline for completing LU 0 and 1 is on Monday (This may also be done by the course moderator).

Week 2: LU 2 on academic publishing

This week focuses on some questionable publication practices that researchers may come across in their academic career. First, we offer a definition of FFP and introduce participants to a website where retracted articles, and also corrections and expressions of concern, can be found: retractionwatch.com. Other topics are invitations to publish work in unknown open access journals, sometimes for a substantial amount of money. We will explore the problem of these predatory journals and offer some clues for how to recognise them. At the end of the week, participants will have a closer look at their own publication strategy. In the image below you can find the structure of learning unit 2.



Start of the week: Notice that in LU 2.4 participants are asked to do a group assignment in which they discuss an integrity dilemma together. The moderator will ask participants to have a look at this assignment early this week, as they are expected to present (as a group) the results of your case discussion in a live session (LU 2.7) at the end of this week. The date of the live session has been sent at the start of this course. You, as a teacher, will host this session.

LU 2.2 - Participants select a retracted article from retraction watch and elaborate the reasons and consequences of the retraction. They also read and post a comment to at least one discussiontopic of a fellow participant. You can check whether all participants have received a comment, and post comments yourself to contributions that lack a reply.

LU 2.3 - Participants select a predatory journal (or conference) from their own domain and/or from their own experience. They provide a short description of the journal and how they recognised it. As a teacher you may want to read some posts, make a summary of the most important points and ways to recognise predatory journals and post this in a news forum to stimulate participants halfway the course.

LU 2.4 - is a group assignment where participants discuss an integrity dilemma together, using the RCR-reflection model. The course moderator will check the collaborative process and urge participants to make a start early in the week. As the participants will present their case at the end of the week (LU 2.7) you as a teacher do not have to provide feedback here, but you can read the cases in LU 2.4.2 as a preparation for the live meeting.

Note: LU 2.4.2 introduces three cases to be presented here in LU 2.7. Sometimes it happens that multiple groups choose the same case and thus present the same case! You may want to

prevent this by asking the groups to consider analysing and presenting a case from their own experience. You may also want to ask groups to mail their first and second preference to you and divide the cases among the groups, so that at least to topics are chosen.

LU 2.6 - is again a portfolio assignment and builds on LU 1.7 in which participants were asked to select two key journals or publishers that they want to publish in and describe the authorship criteria.

In this LU participants are stimulated to think about the authorship order, and possible conflicts of interest that might arise when preparing the manuscripts? As a teacher you may want to read this assignment at the end of the course as part of students portfolio as this assignment will be peer reviewed in week 3 in LU 3.4. For the peer review session it is important that all participants upload this activity as an attachment to a new discussion thread in LU 2.6 before the deadline on Monday at the start of week 3. You (or the course moderator) have to check whether all participants have done this so as to enable peer feedback in week 3.

LU 2.7 - The course moderator will remind all participants of this live meeting in which all groups will present their analysis of the case from LU 2.4. You may want to prepare yourself by looking at the case introductions in LU 2.4.2 and prepare some questions with the RCR-reflection model in mind. You as a teacher will moderate this session, and ask other groups to ask questions:

1. Each group will present for 10 minutes and use the RCR reflection model.
2. Provide room for other groups to ask questions for clarification and discussion. You have to see to it that the most relevant issues are addressed before we move on to the next group.What were the most interesting aspects of their group discussions? How did you come to a decision or what strategy did they use to handle the case? Were they unanimous in their decision? What are the implications for their own research practice? We estimate that for each group appr. 15 minutes will be needed to discuss the case (including discussion)
3. Ask the groups to place a comment in the course environment (LU 2.7) and upload their case reflection (the steps in the RCR model in LU 2.5) or their presentation as attachment. Participants can continue your discussions after the live session via the same comments section!

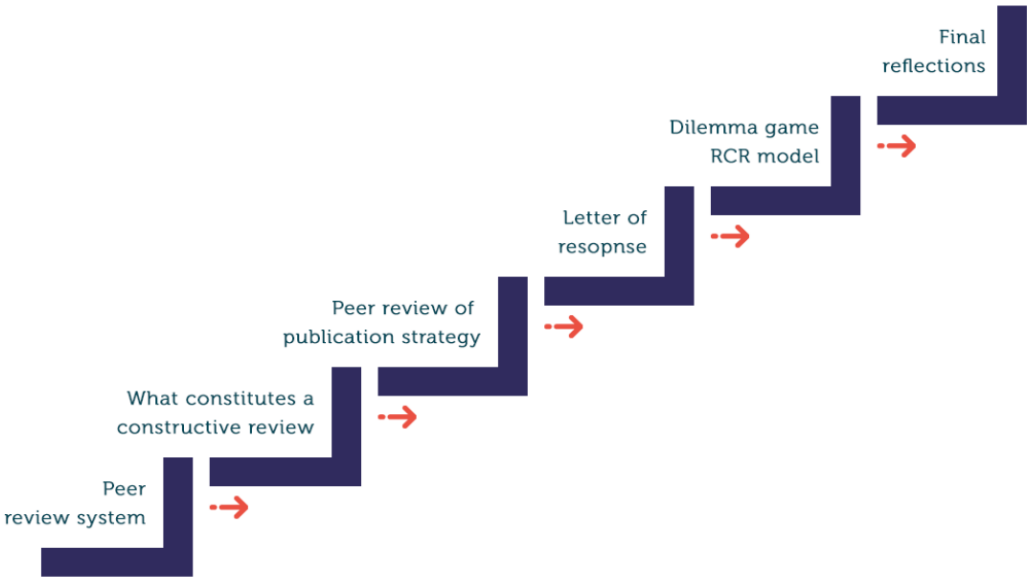
Note: LU 2.4.2 introduces three cases to be presented here in LU 2.7. Sometimes it happens that multiple groups choose the same case and thus present the same case! This means that it is important as a teacher to stress the similarities and differences between the groups and ask them to discuss these.

Thursday /Friday: post an end of the week message in the news forum. In this message summarize the highlights of that week (e.g., insightful contributions of course participants or

interesting discussions). Also you may point out that the deadline for completing LU 0 and 1 is on Monday (This may also be done by the course moderator).

Week 3: LU 3 on reviewing

In the previous learning units we focused on integrity issues regarding authorship and academic publication. In this learning unit we focus on another important aspect of academic publishing: peer review. A scrupulous and honest review takes time and sometimes the decision to accept an invitation to review an article of an international colleague can be problematic in itself. Being reviewed might also raise issues, for example when extra data is requested that authors would like included in another publication. LU 3 introduces academic peer review procedures and recent trends and discussions. Participants will also develop some further experience in what it entails to judge the work of others fairly and in a constructive manner. In the image below you can find the structure of learning unit 3.



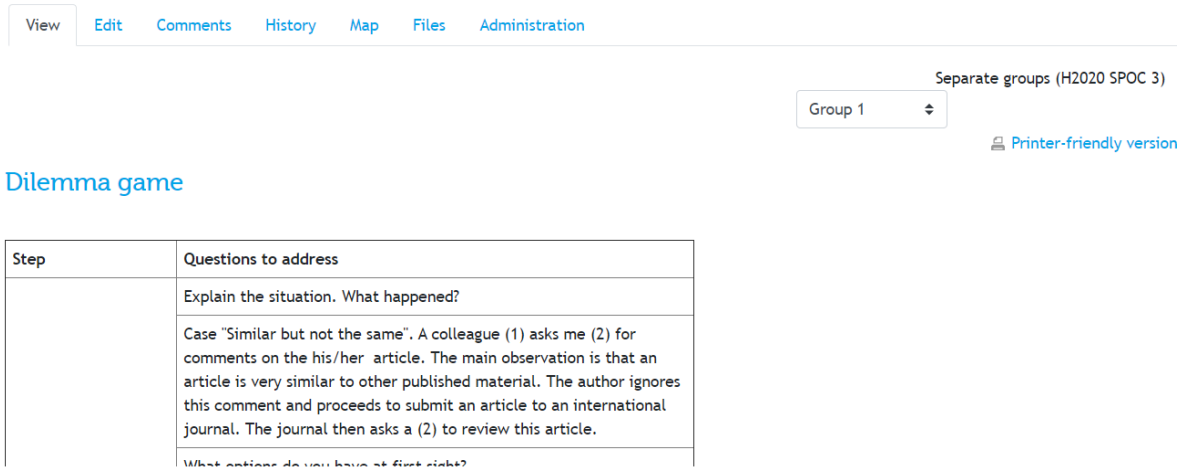
The course moderator will send a message to all participants and urge them to go to LU 3.4 and upload their publication strategy at LU 2.6. This is needed to allow peer feedback to be given this week.

LU 3.4 - Here participants are asked to provide peer feedback on each other's publication strategies. In this assignment it is communicated that the participants will not receive personal feedback from the instructors on this assignment. However, you as a teacher are encouraged to read most of the publication strategies and feedback given and to give some general feedback at the end of this learning unit via a News post. During this LU, you may want to check whether the feedback given is kind, constructive, scientific (see the guidelines

for peer feedback in LU 3.4). The course moderator will check whether the feedback has been given before the deadline.

LU 3.5 - Participants are asked to write an official letter of response to the review on their publication strategy, based on the description above. They also have to post their response and add at least one comment to a response letter of a fellow participant, preferably the one that is addressed to you as a reviewer. As a teacher you may want to check whether all participants have received a comment, and if not you may post a reply to one of the letters of response.

LU 3.6 - is a group assignment in which participants discuss an integrity dilemma on peer review together, guided by the RCR-reflection model. The course moderator will guide the collaborative process and check if all groups have started before the end of the week. You can view the analysis of the students by clicking on a group (see the screen capture below, upper right corner).



Friday: As this is the third week of the course, some groups may start late as they are lagging behind or did experience difficulties with collaboration in the group in previous weeks. Near the end of the first week you may want to summarise the case analysis of one group and post it, to praise their effort and as a general reminder and stimulation for the other groups to finish this assignment

LU 3.7 - is a portfolio assignment in which participants write a brief paragraph on what they think is core to RCR in peer review and discuss dilemmas that arise in their own practice. As we are nearing the end of the course, this LU provide excellent background material to post a news topic on Friday:

In this mail you can:

- summarise the main aspects or insights that participants so far have posted on what they think is core to RCR in publication;

- stimulate the participants that are lagging behind to catch up and use the final couple of days to finalize their assignments (and portfolio) thereby using the insights that their fellow participants already posted.

Ending the course in week 4: LU4, Final reflections and farewell

The course moderator will ask participants to fill in the course evaluation (LU 4.2 Looking back). In this final week, you as a teacher have to make a start with deciding who will be credited with a course certificate. Usually, not all participants will have completed the full course, so a minimum threshold needs to be set. This can differ and it is up to the teacher to decide. You manually check the boxes in the course activity center and you click on the box 'certificate' (don't forget to save your decision). Also check carefully if your changes are changed before you send a final message to the students.

Participants do much appreciate personal feedback on their portfolio assignments. By providing feedback you can acknowledge their efforts and address questions students may have posed. You may also want to refer them to one of the other H2020 courses or other online sources that may be helpful for them.

Logistics

Hours spent

How many hours should you calculate to moderate or teach a SPOC?
We have distinguished hours that are needed to moderate (the more practical and technical stuff) and hours to do the teaching.

The pilots have learned that on average, a **moderato**r spends **2-4 hours** a week during course weeks, and preparatory hours in the weeks before the course (2 week in advance starting to contact the participants, even earlier a subscription system needs to be set), and one-two weeks after the course has finished to make sure that all certificates are dealt with etc.

For the **teacher**, the main hours spent are during the course period: also **2-4 hours** a week (including the live meetings).

SPOC	Moderator time	Teacher
1 (5 weeks)	20 + outside course arrangements	20 hours
2 (3 weeks)	12 hours + outside course arrangements	12 hours
3 (3 weeks)	12 hours + outside course arrangements	12 hours

How to enroll participants?

If you want to organize this within your own institution, a two-step approach is necessary:

Step 1: organize a subscription for the course within your own organization.
Step 2: send/subscribe all participants to the course manually. If the course is hosted by Elevate Health, employees from Elevate Health will prepare the course for you and you will send a list with names and email addresses to them. If you make use of the LLL platform, follow the instructions of the platform (this needs to be finished still)
Step 3: Make sure that all participants are enrolled at least a few days before the course starts

Support

Technical support during the course period

Depending on the platform that you use to teach the course, the platform owner (Elevate Health or LLL) you can get technical support for eg assignments that do not work properly (the courses are copied each time so that you can start in an empty course with new participants (privacy!), yet this can lead to technical issues that need to be fixed.

Support in teaching/moderating: during the lifetime of the project, the Horizon2020Integrity team is available for feedback regarding the content. We believe that all assignments and texts need to be updated at times, and we will guarantee that the courses are available till 5 years after the lifetime of the project (till 2026). We therefore build a network of teachers internationally who use the products in order to evaluate and adjust the course materials so that these can be adequately used by a broad audience.

Finances and legal arrangements

At this point in time, we have no final decisions on the question if the courses can be used for free by all interested parties. The aim is to make the courses available to all at no or low costs as this is an EU funded project, yet, maintenance of the course could require a small investment of parties using the courses. If you want to use the courses, please contact the coordinator (m.a.vandenhoven@uu.nl or m.a.vandenhoven@amsterdamumc.nl) or the project website (www.h2020integrity.eu) for more information. Before December 2021, we will have this information available for all interested parties. Till that time, you are free to use a course developd in the project.

Appendices

Course information template

Instruction for the course moderator: replace the red parts with the required information to create the course information file for your course.

Dear participant to the course *course name*,

Welcome to our e-course on Responsible Conduct of Research (RCR). Below you can find all essential information about the course. We look forward to meeting you in the online environment and in our first live meeting on date and time.

Course schedule

In the course schedule you can find the Learning Units and group assignments that should be completed each week, as well as the dates of live meetings and deadlines.

Week	***Learning Units (LU), group assignments, live meetings, deadlines***
Week 1 (start and end date)	**Learning Units** Add Learning Units that need to be completed this week **Group assignment** Add group assignment(s) that needs to be completed this week (including in which LA it can be found) (if applicable) **Live meeting** Add topic, date, and time of this week's live meeting (if applicable) **Deadline** Add deadline for when this week's LU's should be finished

Week 2 (start and end date)	**Learning Units** Add Learning Units that need to be completed this week **Group assignment** Add group assignment(s) that needs to be completed this week (including in which LA it can be found) (if applicable) **Live meeting** Add topic, date, and time of this week's live meeting (if applicable) **Deadline** Add deadline for when this week's LU's should be finished
Week 3 (start and end date)	**Learning Units** Add Learning Units that need to be completed this week **Group assignment** Add group assignment(s) that needs to be completed this week (including in which LA it can be found) (if applicable) **Live meeting** Add topic, date, and time of this week's live meeting (if applicable) **Deadline** Add deadline for when this week's LU's should be finished
Add more weeks if needed	

General information

- Start course: Add start date course
- Course teacher: Add name course teacher
- Course moderator: Add name course moderator
- To contact the moderator, use the Elevate message function or send an email to add email address
- Certificate at the end of the course: yes, upon finishing all assignments in the course.
- EC: 0.5

How to enter the course?

You will gain access to the course on add date. To enter the course, go to the learning environment of Elevate Health: https://elearning.elevatehealth.eu). If you do not have an account at Elevate yet, you can use the login credentials below. If you already have an account, you can use your existing log in credentials.

Username: your email address
Temporary password: add password (discuss this with Elevate)
If you experience any trouble logging on to the platform, please click the [Help] button for support.

What to expect from an online course?
The course is a small private online course to which only a limited number of participants can subscribe. Each week, new course materials will become available, and you are expected to log in yourself and start with the learning activities. Some of these activities involve interaction with other participants, while others can be done individually. The moderator will check your activity, sometimes comment on discussions, and give some feedback, but will not be present all the time.

Course-relevant information

The course runs for add number weeks. Each week, a number of activities is offered, varying from reading something to a video or an assignment. New content will be made available every week, in order to help you spread the workload for this course more equally.

Once you have logged in, you need to get adjusted to the course environment, and there is the possibility to introduce yourself and upload a photo of yourself (by going to your profile and clicking 'edit'). This will only be visible within the course environment and it may be nice to get to know your fellow participants. So, we invite you to fill this in!

Your own research experience is highly relevant in this course. As research integrity is a topic that involves everyone who is part of the academic community, we will not focus so much on serious cases of misconduct in this course, but rather on the 'grey zone areas' where daily life issues can turn into integrity issues.

We invite you to share your own experiences in this course, and to think carefully about what you need for becoming better equipped to face and deal with integrity issues (in the future) by sharing your thoughts with us in this course. Obviously, we will respectfully and constructively discuss each other's cases.

Portfolio

The course also will make use of so-called portfolio assignments. These are individual assignments that are private and not publicly shared. The moderator will have access and can give you feedback.

Course evaluation

We hope that you will have a positive experience in this learning environment. Your learning journey is central to us. Therefore, we ask you at several points what you think and experience, and how you evaluate certain activities. This could be regarding the content, asking for your reflections, but could also be focused on the course environment. As we are continuously improving the course and technical issues can always arise, we welcome all suggestions.

Thank you in advance for helping us improve the course.

We hope that you will enjoy the course. If you have any further questions, please do not hesitate to ask. You can reach us by sending an email to add email address

Kind regards

Add teacher and moderator names

Additional section

If moderating SPOC 1 (Responsible research through supervision, mentoring, and working together), add the following section to the course information:

Schedule a meeting with your supervisor or mentor

One way of showing responsible conduct in practice is to talk about challenges that you could face as a PhD candidate with your supervisor or your mentor. That is why – as part of the course – we ask you to schedule a meeting with your supervisor or your mentor about RCR. To fully benefit from the course please try to schedule the meeting on add dates of Monday, Tuesday and Wednesday of the fifth course week, i.e., before the end of week 5.

Competence profile

Empowerment towards Responsible Conduct of Research

Helping teachers to empower students for RCR

This competence profile is meant for teachers and educational managers who have a role in promoting & teaching Responsible Conduct of Research (RCR). Central to the profile is the empowerment of students. What do students need to know? What should they do and be able to do when it comes to responsible research? Which attitudes contribute to RCR and should therefore be promoted? Some competences are essential for all good research(ers). We call these 'core competences'. Other competences are 'additional' in the sense that they (can) apply in specific circumstances.

Outline

The profile consists of an overview of the core and additional RCR competences. After presenting the competences, we offer guidance on how the profile can be used. This includes examples on how the competence profile can be translated into actual RCR courses or trainings, for different study levels. Specifically, for high school students, undergraduate students, and early career researchers. Finally, we provide some background information on the view underlying to empowerment towards responsible conduct of research.

CORE COMPETENCES

A good researcher …
Has basic knowledge on what (a) research (project) entails (research cycle, designing a study, using appropriate methodology, collecting & analysing data, reporting findings) and what challenges this brings with it;
Can explain rules and regulations regarding academic & research integrity (like codes of conduct, rules on plagiarism, etc.) and apply them to generic cases
Is able to apply rules and regulations of responsible conduct of research and research/academic values to one's own project/field, and to conduct one's research (project) according to RCR standards and values;
Can recognize and point out what integrity issues are relevant in one's own context and how they relate to debates on Responsible Conduct of Research (RCR);
Is able to identify and reflect on relevant RCR aspects in a given situation;
Is able to determine relevant strategies in a situation in which RCR is at stake;
Can determine an appropriate course of action in a situation in which integrity is at stake (also in consultation with others);
Is an active bystander (i.e. takes active responsibility) when encountering situations that could jeopardize RCR;
Expresses adherence to norms of responsible conduct of research;

Demonstrates in one's reflections and decisions that one feels up to addressing issues of RCR and integrity with others;
Recognizes, and is able to withstand stimuli to condone misconduct;
Understands the institutional context of integrity issues, and how one's individual role is sometimes limited yet relevant;
Acts respectfully towards others (humans, animals, nature) when conducting research (projects)
Acts with honesty, responsibility, and transparency as core values of research;
Demonstrates sufficient analytic, problem-solving, and communicative skills in discussions and deliberations on RCR issues.

ADDITIONAL COMPETENCES

A good researcher can additionally …
reflect on the underlying structures and aims of academic work/research and on how they relate to debates on RCR;
understand, and is able to detect and critique the (cognitive) biases that may lead into integrity issues;
identify topical and novel issues in integrity debates and how they apply to one's field of research (like replicability, photoshopping or the impact of predator journals on the research community);
assess and analyse how the institutional and systemic context aligns or deviates from RCR and what is needed to change it towards RCR;
show the willingness and ability to initiate and lead discussions on responsible conduct of research with peers (colleagues, fellow students);
take responsibility (and shows courage if necessary) to address issues of RCR within institutional contexts;
prioritize (if necessary) responsible conduct of research above one's strive for success as researcher.

Guide to using the profile

The competences are formulated in a general manner. This is intentional. They include important aspects of what is needed for RCR and need to be further specified into learning aims for specific courses for specific target groups.

When developing new course materials, the competence profile can be used as follows.
First, we offer a few 'rules of thumb'.

Rules of thumb

1. Competences need to be interpreted from the abstract to the specific (topic, study level, discipline)
2. When aiming for a specific competence based on this profile, first ask yourself 'how will this empower the students/participants of my course towards RCR'?
3. It is impossible to achieve all competences within the context of one course. Therefore, it is wise to focus on a few competences instead of slightly touching upon them all;
4. If possible, setting up a curriculum (learning trajectory) will help to build capacities throughout the years and will lead to more competences being achieved;
5. Each competence could be achieved on each level of studies, yet it will get a different shape and might apply to different topics.[1]

Here are some examples of how the competence profile could be translated into actual courses or trainings at different study levels.

High school students

Upper level high school students are introduced to (even though not always explicitly) and prepared for higher education. They learn to work according to a certain method if they have to write a paper, to use steps of the research cycle when conducting (a bit of) research on their own, what an experiment entails, to work in a group (and what issues can arise when collaborating with others), etc. In some countries, introductions to science are organized (via projects, via collaborations with universities…).

Example:

Is able to identify and reflect on relevant RCR aspects in a given situation;

If a student, when doing group work, encounters a situation of free-riding, (s)he should be able to recognize not only that the workload is not fairly spread, but that this is also problematic, because someone is profiting from the work that others do. Moreover, reflecting on it, instead of condoning the situation, and actively discussing it with group members (what counts as free riding to them), could be the objective of an RCR assignment.

Is able to apply rules and regulations of responsible conduct of research and research/academic values to one's own project/field, and to conduct one's research(project) according to RCR standards and values;

Knowing how to use literature, paraphrase and use references is something that is often expected, but not explicitly (enough) taught to students. Hence, if you aim to design an

[1] So, it is well possible that one specific competence is core to multiple trainings in various study phases, while other competences could be more study phase specific (e.g. learning how not to plagiarize will not differ much across trainings)

assignment or lesson on this topic, the competence will be interpreted as 'how to apply rules and regulations regarding plagiarism in one's own paper'.

Undergraduate students

Undergraduate students are, when entering the academy, introduced in the status quo of academic knowledge in the discipline of their choice, learn how to use methods and are, step-by-step, introduced in conducting some parts of the research cycle independently. While often undergraduate students are not expected or not allowed to conduct studies independently, they do encounter issues regarding e.g. collection and analysis of data, on how to draw on work of others, or regarding collaboration.

Example:

Can explain rules and regulations regarding academic & research integrity (like codes of conduct, rules on plagiarism, etc.) and apply them to generic cases

When students will e.g. use empirical data collection and e.g. interview persons, it is relevant, from an RCR perspective, that they know what regulations are with regards to ethics review, research ethics (like asking informed consent (IC)) and how to take due care in research with human subjects. One way to contribute to achieving this competence is therefore to help them gain knowledge and how to apply these in their situation.

Early career researchers

Students, either starting in the research master study phase or when starting a PhD project, will turn into independent researchers. They will also become more acquainted with issues that arise in daily life of research practices and are expected to take more responsibilities.

Example:

Demonstrates in one's reflections and decisions that one feels up to addressing issues of RCR and integrity with others;

For many PhD candidates, it is really difficult to feel free to bring things up, especially in hierarchically ordered working situations. So, if for example an authorship issue rises, will the PhD feel up to share her views? In RCR trainings, this could be specifically aimed for and this competence is then interpreted to apply to 'feeling up to addressing authorship issues'.

When developing your course materials…

Each course or training is always conditional on e.g. time spent, group size, expertise by the teaching staff and the mandatory or optional nature of the course, and this influences the number of topics and issues that can be addressed in a course. If you want to know more about what has been proven effective with regards to a number of course characteristics, we

refer to the Quality Checklist for RCR education[2], which gives an overview of 11 meta-reviews on RCR courses., and also advise you to have a look at the Predictive Modeling Tool as developed by Mulhearn et al. (2017).[3]

About this competence profile

How the competence profile was built:

This profile is based on a literature on competences in responsible conduct of research, literature on empowerment education, and common learning outcomes (goals, aims) of RCR education. These were combined into a view on the competences needed for empowerment towards RCR. Consortium partners in the H2020INTEGRITY project who are experts on RCR education were consulted about the formulation of the competences via a Delphi method.[4] A specific aim in building the competence profile was to formulate competences in such a way as to create an "educational pathway" to RCR through different levels of study, from high school to the undergraduate level, and from there to the level of early career researchers. To create this educational pathway to RCR we made two choices:

- To formulate general core competences that can and must be specified further for specific study levels;
- To employing a broad view on research integrity.

Both points are explained in more detail below.

More on core and additional competences:

The profile consists of two levels, which are not hierarchical in the sense that all competences ultimately need to achieved by all. There are standard or core competences that, when specified, are applicable at all levels of study and that all who want to act in a responsible manner in research can acquire. We also formulated additional competences, that apply to those who are at the forefront of responsible conduct in research or have extra responsibilities in addressing integrity issues due to their role in organizations. Thus, the additional competences do not refer to the level of study of the student but rather apply to some researchers with specific positions, whereas the core competences apply to all good researchers.

Holistic and inclusive:

This profile is both holistic and inclusive. It is a holistic model in that many competences are interconnected yet distinguished. For example, one cannot withstand stimuli to condone

[2] http://h2020integrity.eu/about-us/documentation/

[3] https://www.tandfonline.com/doi/abs/10.1080/08989621.2016.1274886

[4] The process leading to this profile is described in D4.1.1 (Composing a standard).

misconduct without being able to identify integrity issues in practice. Or being an active bystander relates closely to express adherence to norms of responsible conduct of research.
The competence profile is also inclusive. This means that it is applicable to study and research activities for upper grade high school levels, undergraduate students in all disciplines and early career researchers.[5] As a result, the profile is still quite abstract and needs further interpretation; that is why we give some examples how competences could be used at the various study levels.

A broad view on 'research integrity' supports the inclusiveness of the competence profile:
In discussions on research integrity, we encounter a lot of definitions and concepts, and at times it can be confusing to put them all in place. For the purpose of this project, which includes target groups from high school students to early career researchers, we decided that more traditional distinctions between academic integrity (AI) and research integrity (RI) or scientific integrity (SI) are less relevant. Instead we will use the concept of research integrity in such a way that it covers all activities and questions that rise in contexts of research projects and that lead to integrity dilemmas. Thus, these include free riding issues, or conflicts of interests as well as issues about supervision and collaboration.
This supports the inclusive character of the competence profile. When talking about research integrity, a high school student might not feel initially addressed, yet in the concrete cases that we use, they are included. For example, we think that at upper high school levels the experiences of doing your own project, working in groups, or learning how to write a good paper are first steps towards conducting research in higher education. The same goes for undergraduate students, who may not conduct independent research yet, but are introduced to how to use research cycles and will have experiences in how to use literature, and in how to analyse and report on data.

Key ingredients: empowerment and 'grey areas':

- Empowerment

Empowerment towards responsible conduct of research is the leading concept underlying this competence profile. What kind of things do students need to learn, know, and be able to do, and what kind of attitude and behaviour do we expect to see in practice so that they can live up to expectations that we currently have in the academy? The perspective of this competency profile is a positive and pro-active one. It is positive in that it is not so much about what you are expected to avoid or not to get involved in (like plagiarizing, falsifying data or committing fraud), but rather about learning how to do it right. It is pro-active in that it helps students to become knowledgeable, to become aware, skilled to recognize, address, discuss and deal with issues that are integrity related and to equip them with the tools, knowledge, skills that are necessary to do it right.

[5] In the guide above, we offer some examples of how teachers could use the competences in teaching RCR to pupils, students and researchers.

Empowerment also stimulates a reflective attitude on integrity issues. Notice that by taking this focus, rather than aiming primarily at classic FFP cases,[6] we deliberately broaden the scope towards daily life issues in research projects and practices that require attention, cases that are not always immediately right or wrong (like order of authorship, or conflicts of interests). Yet, all these cases share that they are inherent to doing research. We focus, in other words, on grey areas (see below).

In our search to define empowerment we came across empowerment educational literature, that characterizes empowerment as developing a critical autonomy, learning to take responsibility and developing an attitude of 'feeling up to' addressing (integrity) issues in practice. For example, if a group member free rides on an assignment, a student should feel up to addressing this, and the overlap with the nature of the dilemma with addressing guest or ghost authorship when preparing a manuscript is striking. Feeling up to address issues requires a bit of courage, both for a high school student and a PhD candidate or senior researcher. Empowerment also refers to developing a critical autonomy. Lawson describes critical autonomy as 'the ability to think for oneself, the ability to use theory as a guide to action, and, crucially, the ability to evaluate the circumstances of one's life, including the structural forces that surround us.'[7] If we apply this to the context of research integrity, we detect the relevance of self-awareness and reflection (being able to think for oneself), the relevance of deliberations leading to action (in cases of integrity), and the urgency of being able to determine what this will imply for oneself, given the fact that one is embedded in an institutional context. Research integrity issues cannot be changed singlehandedly, and quite often, individual researchers will feel like whistle-blowers when bringing up issues in practice. Therefore, realizing that one's contribution can be modest, while the collective effort will have impact, is a highly relevant aspect of empowerment. Empowerment is about the interaction between individual, group, and system/society.

That said, this competence profile focuses on those competences that are specifically contributing towards the empowerment of students in RCR. We do think, however, that reflection on the potential impact of research culture and institutional settings on RCR are important aspects to cover in RCR education. For instance, having students reflect on the actual research culture and institutional setting in which they have to do their research, provides opportunities to empower students in relation to these contributing factors as well. Also, it prevents over-individualising RCR.

[6] FFP: Fabrication, Falsification, Plagiarism.

[7] Tony Lawson. Empowerment in education: liberation, governance or a distraction. A review. Power and Education, Vol 2 nu 2, 2011 (89-103)

- Grey areas

A similar debate like on the concepts of integrity we encounter in defining the types of issues that we want to include when talking about research integrity. To us, the most relevant cases are those dilemmas or situations that (each) researcher encounters and that require reflection and action. The cases that 'bother' people in research practices are usually not the traditional FFP type of cases, which are often clear-cut cases of wrongdoing. Rather, there are many situations that have become common practice in daily life and that can be disputed. These are the grey areas. Do you take the suggestion of a reviewer to include a certain reference, if this could be a reference to the own work of the reviewer (with the intention to be cited more often?) and do you follow up on the request of your supervisor, even if you and your colleague think that this is not the best way to analyse your data? Or how do you go about if a colleague is unwilling to share her data with you?

We purposely use the notion of grey area and try to avoid the use of notions like questionable research practice (QRP) or detrimental research practice (DRP) even though these are quite common in the literature on research integrity. Why? Because this is already taking a negative attitude towards issues that occur in practice and we are focusing on how to do things right. It is not immediately wrong if you feel unhappy about the order of authorship in a publication and do not dare to address it. You are not 'on the wrong track' if you encounter a situation, nor do we assume that researchers are all potential wrongdoers. Things happen, often without being aware of it (you just 'go with the flow'). Therefore, students have to learn how to discuss these issues, and this requires awareness, understanding, skills and a certain attitude to dare to address it.

It is exactly because so many situations have aspects of integrity inherent to the situation, that it is better to learn to recognize and address these issues in practice, and to try to act in the right way, instead of only focusing on the wrongdoers. Learning that responsible conduct or research is or should be the default position for researchers is not helped by only hearing about cases of misconduct. Focusing on the commonality of many situations in practice and helping them to start asking questions and to become transparent about choices, decisions and routines in research might be a better way.