



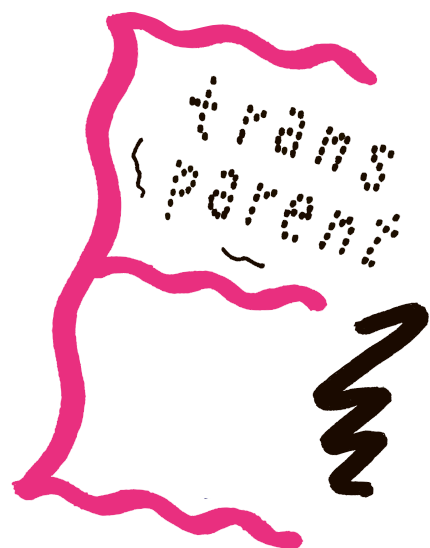
Putting **OPEN SCIENCE** into practice in economics

*The best strategies and investments for more transparency
and visibility in economic research*

TEIL 3: Work sheets



You want to build up your Open Science muscle step by step? Then here's a little training schedule for you. We have prepared 20 worksheets for you, depending on how much time you want to invest every week. Spend 5, 20, 45 or 60 minutes to raise your digital visibility.



1 Increase your *visibility*



Almost 40,000 economists are currently employed in German tertiary education. They all strive for recognition and visibility – just like you. So how do you manage to make your research transparent and to be visible – to your peers, your future employers or funders? It’s simple. Show them what you do, which projects you are engaged in, with whom and with what data you are working.

Duration 20 min.

Create an account with Open Science Framework → osf.io. Register. Create a new project under “My Projects”. You can now reference the project URL in your publications. And when you have finished the project, you can change the project status from “private” to “public”.

In addition to your profile page on the website of your university or research institute, create a professional Social Media account – or several, maybe on LinkedIn, Twitter or ResearchGate. Link here to your publications, your data, and mention with whom you collaborate in which projects.

Checklist:

- Create account with Open Science Framework
- Link to your Open Science Framework project on your university profile page
- Create Social Media account
- Share at least one publication via Social Media

Room for your notes:

2 Improve your own research with *preregistration*



Everyday we make thousands of decisions. But do you still remember, after months or even years, why you decided this or that? The solution: document your decisions in your research process retraceably. Improve your research with a preregistration. By writing down hypotheses and specific details, such as data collection methods, analysis plans and rules for the selection of observations, you can make important decisions early and systematically. This documents your decisions in ways that can be reproduced later. The preregistration of studies is an important tool of the Open Science movement and is available on different platforms.

Duration 15 min.

Use a document that describes your project. This can be a brief or a very detailed description.

Upload your files to → **Open Science Framework (osf.io)**. There are many different templates for preregistration available by now (see → osf.io/zab38/wiki/home). A step-by-step instruction can be found here: → zbw.to/Vorlage_OSF

In your papers and on your profile page you can link to the preregistration “This project has been preregistered before the start of data collection, see [osf.io/...](https://osf.io/)”

Checklist:

- Select template for upload
- Check instruction
- Upload file to Open Science Framework
- Link to upload on profile page

Room for your notes:

3 Speed up your *publishing process* with an **ORCID ID**



Do you know this situation? You're losing valuable time typing the same standard information into forms? And yet it can be so easy. Improve the visibility of your research and accelerate your publishing process by transferring standard information automatically, for instance with your ORCID ID.

The ORCID ID (Open Researcher and Contributor ID) is an identification number for authors with unlimited validity. It gives you a persistent ID that will accompany you for your entire career, even if you change your name or university. Even if your research findings and activities are not indexed in databases such as Web of Science or Scopus, they can still be correctly and automatically attributed to you and can be found at any time.

Duration 5 min.

Go to the homepage: → orcid.org.

At → orcid.org/register you can get your ORCID-ID. A profile is created automatically. The profile shows your name and your ORCID. A confirmation e-mail will be sent within a few minute.

That's it.

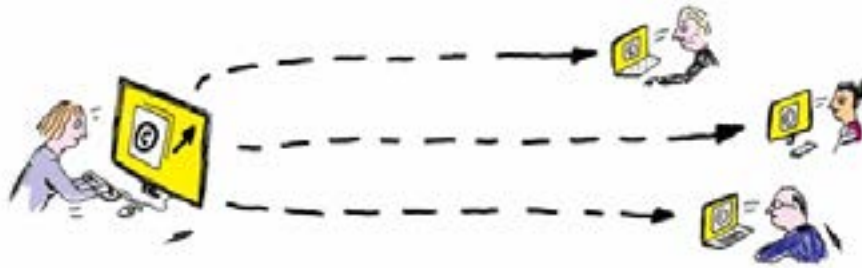
If you want to continue, you can complete your profile with additional information under "2 - Use your ORCID ID". Each section has privacy settings, so you can decide which information is to be public, which is to be visible to select persons and which is visible only to you. And now you can get started and use your ORCID ID for preregistration.

Checklist:

- Create ORCID ID
- Use ORCID ID at least once

Room for your notes:

4 Make your own data *sustainable and transparent*



The “credibility revolution” is playing an important role in economics right now. Besides the economists themselves, renowned journals and professional associations advocate more credibility and transparency for economic research in Germany. The requirement for transparency and reproducibility in economics has become much more important for the evaluation of research projects and findings.

How can you grant access to your data and analyses? One option is to do it manually. At the end of your paper you could write: “Data and code available upon request”. If someone requests the additional material from you, you send it by e-mail.

The better and more sustainable option is to upload your data into an online repository and thus make it more easily accessible to others. Try it.

Duration 20 min.

Prepare your final and well commented analysing scripts (e.g. R Code, SPSS syntax, Stata code). First test again if your script, executed with your data, provides exactly the same result output that you describe in your paper.

Upload your script to → **Open-Science-Framework (osf.io)** and include the link in your publication.

The special feature of Open Science Framework is that you can link up all your projects and sub-projects and that you can get a DOI (Digital Object Identifier) for your project. This means that your additional material can be cited. If a researcher builds on your analysis, he or she can cite your material. If you take

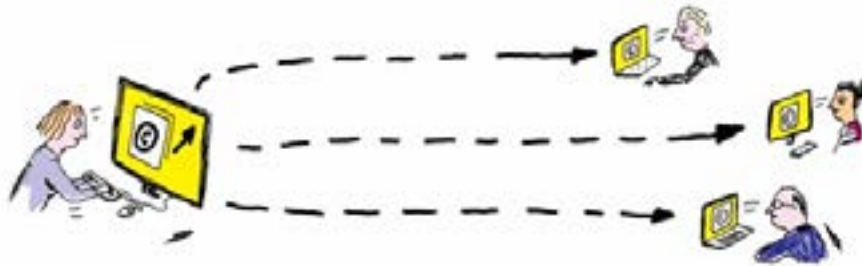
the trouble to practise Open Science, you might just as well get credit for it.

Checklist:

- Check analysis script
- Upload analysis scripts to
→ **Open-Science-Framework (osf.io)**
- Get DOI
- Cite DOI and communicate to peers, e.g. with my Social Media account

Room for your notes:

5 Link your own paper and analysis efficiently



It is time-consuming and nervewracking to upload working papers and their “supplementary materials”, i.e. data and analyses, separately into a repository and then to match them again. Do you feel the same way? Wouldn't it be more efficient and better for your nerves if you linked your analysis and your paper from the very beginning? Just give it a try.

Duration depends on the status of your research project

Organise your research from the very beginning in projects. Start with a folder bearing the project's name and create two subfolders named “manuscript” and “additional materials” for data and analyses. Once you have finished your project and your paper, work continues seamlessly in the Open Science Framework, because all materials in your project are already linked.

Checklist:

- Create folder with project name
- Create subfolder “manuscript”
- Create subfolder “additional materials”
- Sort research documents painstakingly

Room for your notes:

6 Make your *preprint* accessible



Did you know that only half of all papers cited in journals are read by someone other than the authors and their reviewers? 90 per cent of all papers are never cited. What a shame! Is there an effect on the citation and sharing rates if articles are published as preprints first? A team of researchers from ZBW – Leibniz Information Centre for Economics and GESIS – Leibniz Institute for the Social Sciences has found that articles which were first published as preprints are shared and cited online much more frequently than others which were not made available as preprints. Read the details here (see → [zbw.to/interview_preprints_eng](https://www.zbw-to-interview-preprints-eng)). Join the winning team.

Duration 15 min.

If you want to present your pre-print to your fellow researchers for a peer review, you can do so in a repository for economics, for instance → econstor.eu. Economics has a publishing culture in which most research findings are first presented as working, discussion or conference papers, in order to get feedback for new ideas and methods.

Try uploading your next preprint to → econstor.eu.

Checklist:

- Upload latest preprint to EconStor
- Disseminate URL with permalink from your profile page and Social Media

Room for your notes:

7 Increase your *visibility* with transparent data



*You want to be cited? Then you may be interested to know that articles with published research data are cited significantly more often than comparable articles where the corresponding data are not published. This has been shown by numerous international empirical studies. The availability of data used for a publication helps you to be noticed in your community. Publishing your dataset on → **Open Science Framework (osf.io)**, the “all-purpose” tool, is a good start.*

Duration 2 to 3 hours

Before you publish your research data, you need to ask permission from all your test persons. Have them sign a declaration of consent. A template can be found here.

If you are working with sales figures, foreign trade statistics, BIP or other statistics, you can skip this point. Instead you need to clarify if and how you may publish the data you used (e.g. all your raw data without restriction or your analysis dataset).

All primary data that are necessary to replicate your results must be made available. As a first step, anonymise your data (delete variables, aggregate etc) and prepare your code book by describing your variables and the path to your dataset (e.g. sub-sample of dataset XY; accessible at institution XY).

Upload your dataset and your code book into your pre-existing project at → **Open Science Framework (osf.io)**.

Create a DOI (Digital Object Identifier) to make your data citable (“create DOI”).

Add the link to the data and code book to your publication.

Room for your notes:

Checklist:

- [*for surveys] Ask participants if I may publish anonymised research data
- Deposit declaration of consent
- Anonymise all data
- Prepare code book
- Upload data file(s) and code book into my project at → **Open Science Framework (osf.io)**
- Create DOI
- Add link to my publication
- Share publication and link with my peers on Twitter, ResearchGate etc.

8 Increase your *visibility*



You want to be seen by your peers, potential cooperation partners and possible future employers? Of course you do! Because things can happen only if you are visible. Did you know that Open Science offers verifiable citation benefits? Use Open Science as a catalyst for your career in research and talk about the openness of your work.

Duration 20 min.

Link your account on → **Open Science Framework (osf.io)** to your profile page on the website of your research institution.

Highlight your Open Science activities in your CV.

Invite your favourite colleagues to view your materials, data and scripts. Cite your own materials.

Checklist

- Link OSF profile to university website
- Amend CV
- Cite my own materials, data and scripts in publications

Room for your notes:

9 Talk about *research data*



Did you know? Open Science opens up space for collaboration with scientists from your discipline, either in the office next door or in the USA. Open and transparent science also enables collaboration with scientists from quite different disciplines, such as infection research. Just talk about it.

Duration 10 min.

Tell your colleagues in the corridor, at lunch or in the coffee room that you created an account at → **Open Science Framework (osf.io)** and that you uploaded your materials, data and scripts.

Ask your colleagues if they would be interested in using the data collaboratively in a new project.

Remind your colleagues about the conversation by mailing the link to your OSF profile so they can look at your materials. Invite them expressly to a collaboration.

Checklist

- Mention my OSF profile
- Mention my own materials, data and scripts
- Talk about possible collaboration
- Send the link to all who were present at the conversation

Room for your notes:

10 Publish apparently insignificant results



What is a good and what a bad result in a study? Does insignificance truly mean the result is boring and the research question irrelevant? Or could an insignificant result just indicate that the correlation posited between phenomena does not exist? Okay, this is a rhetorical question. Regard all findings – be they significant or insignificant – as a relevant result that deserves to be explained. Scientific evidence results from methodologically correct studies and the interpretation of the findings resulting from them. Scientific relevance does not result from “searching” for pre-fabricated findings. Save yourself time, money and energy with a preregistration of your study.

Duration 120 min.

Try submitting your research plan as a pre-study to a journal **before** collecting data. Here’s a list of such Registered Reports: → zbw.to/SzyA2

This is the idea behind it: reviewers will assess whether the proposed methods, the theoretical basis, the statistical meaningfulness etc. are appropriate. The journal then offers an “*in principle acceptance*” (IPA), which means: “We will publish your paper whatever the results (as long as you stick to the agreed plan)”. Thus you as an author have a guarantee that your results will be published even if they are insignificant, and exaggerated interpretations of findings can be avoided.

Here you can find a checklist for such a registered report: → osf.io/93znh/

The alternative is to publish at “Experimental Results”, a journal for research data that presents insignificant or inconclusive findings (see → cambridge.org/core/journals/experimental-results). Here is an online seminar on “*Pre-results Review in Economics: Lessons Learned from Setting Up Registered Reports.*” by the Center for Open Science: → youtube.com/centerforopenscience

Checklist:

- Watch webinar (1h)
- Scroll through list of registered studies
- Print out checklist for registered studies
- Submit registered study

Room for your notes:

11 Practise your *elevator pitch* with family & friends



Do you admire those successful networkers at conferences who charm others with anecdotes about their research, their latest interim reports or even a great breakthrough? Do you want to win potential new cooperation partners, employers or funders with your eloquence? You can practise this with interested laypeople who are well-disposed toward you. Your own family and friends can provide optimal training grounds here. Have fun doing this.

Duration 15 min.

At the next family reunion or the next virtual call with your friends, tell them about your latest research findings.

Beforehand, think how you would answer these questions:

1. What have I (and my team) found out?
2. What does this mean to my scientific community?
3. What does it mean to the person in front of me now or in the future (“If you at any time do ..., then you can now ...”)?
4. Which problem have you solved for society?

Try out different variations.

Room for your notes:

Checklist:

- Prepare at least one “So what?” argument (What does my research mean to society and thus the person in front of me?)
- Use at least one anecdote to illustrate what I say
- Use everyday objects to explain things, e.g. cutlery, crockery, fruit, matches (whatever lies around at your family reunions and parties)

12 More visibility after conferences



Are you still thrilled from your last conference, either analogue or digital? Have you networked successfully, presented yourself phenomenally or been inspired by the talks and presentations of your peers? If you have been invited to a conference as speaker, have you ever thought about prolonging your visibility beyond the actual event? Sounds exciting, good luck.

Duration 15 min.

Upload your conference slides to → [Zenodo.org](https://zenodo.org) and disseminate the DOI (Digital Object Identifier) on your Social Media channels. Login with your ORCID ID (which you created after reading work sheet 3).

DOIs are persistent identifiers which you and others can use to cite electronic resources (texts, research data and other contents) unambiguously. See details here: → zbw.to/DOI_facts

Your materials – you can upload much more than slides – are safely stored with Zenodo at the CERN data centre. They are citable within seconds through the DOI. Usage statistics are also available.

Checklist:

- Look up ORCID ID rausgesucht
- Check slides again (don't forget contact details!)
- Upload slides
- Communicate DOI to conference contacts and through your Social Media channels (“If you couldn't be in X City for the Y conference, watch my slides here...”)

Room for your notes:

13 Anonymise *datasets*



Did you know? Studies that made data available in a public repository received more citations than similar studies where the data were not made available. This is what Heather Piwowar and Todd Vision found out (see → <https://doi.org/10.7717/peerj.175>). If you upload your raw data, and the datasets on which the final analyses are based, to a secure repository and make them accessible (with a link in your manuscript) you become more visible to your peers. An important step in the preparation process is the anonymising of the data, i.e. you remove all information that would enable others to identify individual people.

Duration 45–60 min.

Verify that nobody can identify a person through a combination of different rare characteristics (e.g. place of birth, gender, number of semesters, age). For example: because there is only one female student of business administration in Leipzig who is 33 years old etc.

If in doubt, delete all critical characteristics from the dataset you want to publish or combine characteristics into categories. Then you could have several female students of business administration in Saxony aged between 30 and 40.

Data that cannot be anonymised, such as videos, images, audio recordings, can be published in a processed version (i.e. as a transcript).

Document your actions in an anonymisation protocol so that data can later be de-anonymised.

Link tips:

(please note that these tips may not conform to German data protection law)

- → <https://amnesia.openaire.eu/>
- → <https://www.ukdataservice.ac.uk/manage-data/legal-ethical/anonymisation.aspx>
- → <https://ico.org.uk/media/for-organisations/documents/1061/anonymisation-code.pdf>
- → <https://www.ed.ac.uk/data-protection/data-protection-guidance/specialised-guidance/anonymisation-personal-data>

Checklist:

- Obtain declaration of consent beforehand and archive
- Familiarise yourself with data protection
- Consult with data centre
- Anonymise data
- Upload data
- Publish DOI

Room for your notes:

14 Get credits for datasets



If you publish a dataset you collated yourself, you will be cited more often. You also enable secondary users to verify the research findings and their robustness and to sustain them.

Duration 20 min.

Familiarise yourself with the following three repositories for research data from economics and the social sciences:

- datorium (provided by GESIS) via → data.gesis.org/sharing
- Research Data Centre Enterprise and Organisation Data (→ zbw.to/FDZ-BO) (provided by DIW German Institute for Economic Research, in German only)
- → forschungsdaten-bildung.de (operated by Research Data Centre for Education of the DIPF – Leibniz Institute for Research and Information in Education)

Checklist:

- Check datorium
- Check FDZ-BO
- Visit “Verbund Forschungsdaten Bildung”

Room for your notes:

Datorium

FDZ- BO

Verbund Forschungsdaten Bildung

15 Organise knowledge transfer efficiently

Most universities now pursue knowledge transfer as a “Third Mission” besides the core tasks of research and teaching. Do you want to contribute efficiently and purposefully to this field and to improve the dialogue with business, politics and society? Then do like every good start-up does. A start-up must present a business plan which explains the market gap it wants to close, the customer groups it wants to serve and what their needs and wishes are. Knowledge transfer – better still knowledge dialogue – works just the same. Different stakeholders have different needs and problems.

Duration 15 min.

Before you go into your next interview, prepare your next podcast, give a presentation before non-scholarly deciders or write a text for your university’s website, ask yourself:

- Who exactly will listen to, look at, or read my contribution?
- Why do these people want to listen to, look at, or read my contribution?
- What is the problem that my contribution can solve for these people? Do they want to understand a known issue better, are they looking for cooperation partners in a joint project, or do they need answers for a concrete entrepreneurial question?
- Why do you undertake this work in this particular format (text, interview, presentation...)? What would it need to be memorable to you?

Checklist:

- Identify target group
- Empathise with your target group
- Reflect your own motivation



Room for your notes:

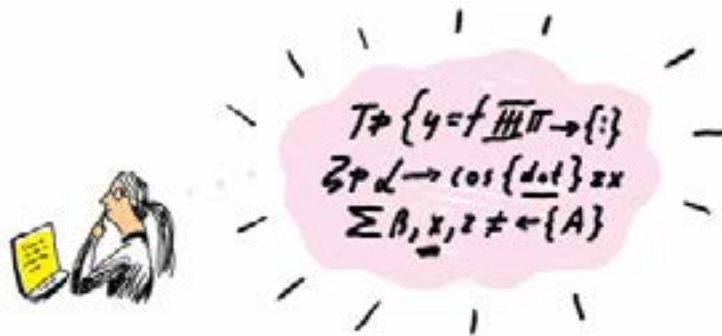
Who is the audience?

Which problem do I solve for the audience?

Why is the audience here?

When and how is it a success for me?

16 Presenting knowledge transfer clearly



Why do you give presentations when your institution holds Open Days? Why do you write about your research on the website of your university? Why do you invest precious working time? Because you are an economist and like many other economists you want to contribute to solutions for urgent societal problems? Then you need communication skills besides solid scientific grounding. We are talking about writing comprehensibly. Try this with a few simple tricks.

Duration 15 min. for the test + 30 min. for re-writing

The next time you write a text for publication outside a scholarly journal (on a website, in a brochure, in a blog, ...), test it for readability and understandability.

If you find that your text needs to be improved before it can usefully transfer knowledge, try the following methods:

Shorten sentences and your text

- Write only one idea per sentence.
- Use 7 to 11 words per sentence.
- Love to learn your main clauses and avoid subclauses.
- Shorten your text until it takes up no more than two screen pages.

Monitor and reduce nominalisations

- Highlight all the nouns in your text. Try to find plain substitutes for complicated terms.
- If possible, rephrase your sentence using verbs.

Explain technical terms

- Highlight all technical terms with a different colour.
- Do you want to keep them? Then explain them.
- Can they be replaced with synonyms? Then use generally known words instead.

Give structure to your text

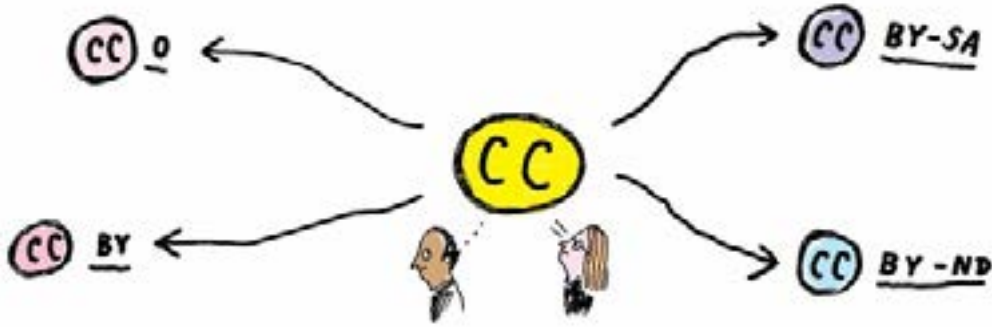
- Divide your text into paragraphs or thematic blocks with headings. This increases readability.

Checklist:

- Test text
- Shorten sentences
- Shorten text
- Divide text into sections and add sub-headings
- Remove technical terms and nominalisations

Room for your notes:

17 Open Educational Resources



You want to contribute actively to the digital transformation of teaching? You have created course materials, textbooks, videos, multimedia applications or podcasts for teaching and want to reach a wider audience? Then transform your teaching materials into Open Educational Resources (siehe UNESCO-Definition). Have a look at the different kinds of licences below.

Duration 15 min. for familiarising yourself with licence types PLUS 20 min. for publishing your first OER

Become familiar with the Creative Licence family → creativecommons.org for Open Educational Resources – OER.

CC 0 – Public domain

Material licensed thus is in the public domain and you renounce your legal rights as author. People who use this material do not need to name a source.

CC BY – “made BY Kim Schmidt-Schulze”

CC BY requires stating a name. People who use your material under a CC BY licence must name you as the author. There are no other restrictions; materials can be reworked and disseminated.

CC BY-SA – “made BY Kim Schmidt-Schulze” PLUS share under the same conditions

CC BY-SA requires that secondary users state the author’s name and disseminate it under the same conditions. SA means “Share Alike”. Secondary users must publish the material under the same CC BY-SA licence after they have altered it.

CC BY-ND – “made BY Kim Schmidt-Schulze” PLUS no modification

There is also the CC BY-ND licence. ND means “No Derivatives”, i.e. no modification. Your original material can only be used in its original form, your name must be stated (BY) and may not be altered.

Now publish your teaching material under a Creative Commons licence, preferably one of the first three.

Checklist:

- Learn about Creative licences
- Select teaching material for a first trial
- State licence clearly in your material
- Publish OER
- Advertise your first OER on social media

Room for your notes:

18 Demonstrate coding skills



With Open Source software you can amply demonstrate your comprehensive coding skills. If you want to leave a footprint here, publish your software and pick up feedback from your peers at the same time.

Duration 15 min.

Most widely used, as well as powerful and efficient, is **→Github.com**. GitHub hosts your Open Source projects and is similar to social networks. You can publish your Open Source code here. The Learning Lab provides support for beginners.

Today's task is to create a GitHub account and to install Git locally. Here's how to do it:

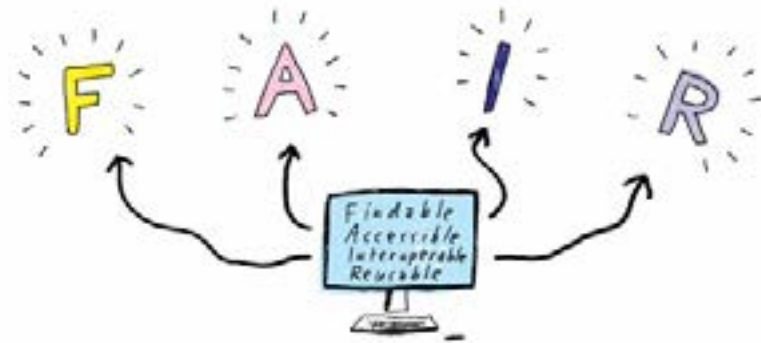
- First create an account with **→Github.com**.
- Install GitHub on your local computer via **→git-scm.com/downloads**. Select the installer you need for your operating system.
- Start the newly installed Git bash under Windows. Under macOS and Linux you start the normal terminal.
- Use 'git config --global user.name "[Name]"' to define your name.
- Just like your name, you use 'git config --global user.email "[Mail]"' to define your email address. Use the same address you have used for your GitHub account.

Checklist:

- Create GitHub account
- Install Git locally
- Upload your code

Room for your notes:

19 The *FAIR* principles for research data



More and more funders require that researchers collating data observe the “FAIR” principles regarding research data and their reuse. Take a short Deep Dive into this topic.

Duration 60 to 120 min.

A brief word upfront: the abbreviation FAIR describes the four criteria Findable, Accessible, Interoperable and Reusable. Research data must be processed in such ways that humans and machines can find, access, link and reuse them. The first and foremost requirement for producers of research data is the need to create metadata so they can unfold their full effect, for instance on the Semantic Web.

Your tasks:

Brush up on metadata standards (see → rdamsc.bath.ac.uk), so that a mapping between different kinds of metadata is possible. Many urgent problems of our time can only be solved with interdisciplinary work (e.g. “Will humankind still be able to eat fish fifty years from now?”)

Clearly state the conditions for reusing your data (e.g. under which Creative Commons licence). (see work sheet 17)

Describe your data with metadata.

- Start with administrative metadata (author, origin of all data etc.)
- Add subject-specific metadata (describe the contents of the data)

If you add a Digital Object Identifier (DOI) to your data, you can increase the findability (and of course the probability of citation).

Checklist:

- Check metadata standards
- Document the conditions for reuse
- Describe dataset
- Assign DOI

Room for your notes:

20 *Publishing in an Open Access journal*



Publishing in Open Access means there are no financial or copyright obstacles between your research findings and your readers. Everyone who is interested can access your publication without costs. One logical consequence of this is increased visibility for you. The Directory of Open Access Journals helps you to find a suitable journal.

Duration 15 min.

You want to publish your paper in an Open Access journal but do not know which one? There are two good options:

1) Talk to the Open Access officer of your university. If no one at your institution holds such a position, you are welcome to talk to our Open Access officer. Here are the contact details of Olaf Siegert: → zbw.to/Siegert

2) Search the Directory of Open Access Journals (→ DOAJ.org).

- The Directory of Open Access Journals is the leading catalogue of all Open Access journals.
- Journals listed here are scrutinised closely and individually to filter fake journals (so-called predatory journals).
- It currently indexes 15,000 Open Access journals from all fields of natural sciences, technology, medicine, social sciences and humanities.
- You can see quickly how peer review in journals is organised (open, blind or double blind).

Have fun exploring the site.

Room for your notes:

Checklist:

- Find the Open Access officer of your institution
- Browse the Directory of Open Access Journals
- Share my knowledge with my colleagues

You're done!

You have finished all the work sheets. Congratulations!

And it wasn't so bad after all, was it?

You now have a solid basis for your Open Science practice. We hope we have motivated you to continue with it in the future. We also encourage you to pass on the Open Science torch to someone else and to spread the practice in economics.

Stay tuned

The ZBW – Leibniz Information Centre for Economics aims to enthuse economists for Open Science and to support them on this path. We want to encourage you to keep going.

Online magazine “Open Science Magazine”

The Open Science Magazine invites you to discover science in the digital age: new, modern, future-oriented. Every month we propose new perspectives, articles, podcasts and work sheets around Open Science to inspire you. Let us learn, grow and advance together. → www.open-science-magazin.de

Portal Open Economics Guide

The Open Economics Guide offers you an overview of Open Science, practical orientation and instructions, including: a quick and easy guide to Open Science topics (Open Science, Open Access, Open Data and Open Tools), a comprehensive tools library geared to the stages of scientific workflows, and a concise glossary explaining the most important concepts regarding open research. → openeconomics.zbw.eu

Workshops and events

Meet us at the Open Science Conference, the Open Science Barcamp, at one of our numerous workshops or online seminars, or soon at the Open Science Retreat. The dates can be found on our website. → zbw.eu

The Open Science Magazine of the ZBW – Leibniz Information Centre for Economics provides economists with the Best Practice experiences of their peers, work sheets with concrete tips, guides to good science communication, background information on current Open Science developments and interviews with inspiring transformation ideas.



www.open-science-magazin.de

Imprint

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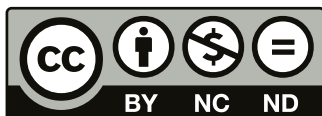
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