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Establishing an Effective Open Science Team: A Recipe for Cultural Change in Institutions

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NUTRITION INFORMATION

This recipe strives to be a valuable resource for anyone interested in championing open science at an academic institution. The steps outlined here will guide you in building an effective open science team that will work towards a more open and collaborative future in research. The aim of an open science team is to increase awareness of open science and to gain insight into the requirements of all individuals involved in research so that they can engage with open science practices more effectively. Often, researchers are aware of some open science concepts, but they may not know how to begin implementing open science practices in their work. An open science team can start setting up implementation guidelines, as well as serve as a platform that unites open science enthusiasts who are willing to contribute to the advancement of open science principles. Direct lines with leadership also allows for change and impact at the institutional level.

While the overarching goal is to establish a long-term presence for the open science

team, it is designed with the flexibility to accommodate the diverse commitments of its individual members. An open science team is an asset to the institution, but it also offers team members an opportunity to learn more about open science and cultivate transferable skills that may be relevant to future tasks and opportunities.

LEARNING OUTCOMES

When following this recipe, you will learn more about:

- **How to build an effective open science team.** This includes strategies for recruitment, organization, and fostering participation and collaboration among team members.
- **Creating impact at the institutional level.** How can you use a team to advocate for and implement changes supporting open science principles at the institutional level?

NUMBER SERVED

The open science team provides individual team members with opportunities and influ-

ences each team member's department. This influence extends not only to the department or institute where the open science team is based, but also to the entire university. For example, our open science team serves as a model for other institutes within the university, which have been inspired to set up their own open science teams.

COOKING TIME

Setting up a team may take several months, as gathering all the ingredients is no small feat. The first crucial step in setting up an open science team is to seek the necessary approval and alignment with leadership. This may involve gaining approval from your institute or department's leadership, academic committees, or other relevant parties. Be prepared to outline your goals, objectives, and the potential benefits of having an open science team at your institute. Gaining support for the team may take several months.

Our open science team held four ninety-minute-long team meetings during the academic year. This alignment with the academic

year ensures that your initiatives fit into the schedules of team members. Team meetings will take preparation: team members typically required thirty minutes, while the coordinator typically spent ninety minutes preparing for each meeting.

DIETARY GUIDELINES

The aim of an open science team is to increase awareness of open science and to gain insight of the requirements of researchers so that they can engage with open science practices more effectively. Researchers are increasingly asked by journals, funders, and institutes to follow open science practices, which can be difficult if they are not sure where to begin. An open science team can help evaluate the practices that are already well established within a given institution/department and determine what additional support (in the form of courses, workshops, guidelines, or information sessions) may be helpful.

INGREDIENTS & EQUIPMENT

This recipe requires the following ingredients:

- a **team** of at least four and no more than ten members:
 - Team members should be representative of your organization's composition in terms of department and population.
 - Each team member should be able to attend team meetings and dedicate time to their assigned responsibilities.
 - The open science team at our institute consisted of eight members,

with at least one representative from each of the six departments (one department was represented by two PhD candidates). Team members were chosen to represent a diverse spectrum of backgrounds (seniority, research or work focus, gender, position) to ensure diversity in the perspectives that were brought to the table.

- Members should ideally serve for a minimum of one year, with the option to continue into the next year. Slow, yet regular turnover of team members will help to ensure that new topics and issues faced by researchers can be recognized and addressed quickly.
- A **coordinator** with sufficient time to organize team efforts (ideally around one hour per week of dedicated time).
- **Support from leaders** in the organization, which can take the form of language in the strategy or mission statement that underscores a commitment to open sciences practices and/or direct lines of communication with the management team.
- **Communication channels** such as email or a Microsoft Teams Channel, or survey tools such as Microsoft Forms.
- **Rooms** for team meetings, as well as access to food and snacks.
- **Presentations** and/or **tools** such as Mentimeter and Slido to gather input from discussions or surveys.

PREPARATION

It may take time to get leadership on board to be able to start with your open science team. Engage leadership with the latest developments regarding open science, particularly recent requirements from research funders. For example, the main funding program for research innovation of the European Union, Horizon Europe, includes open science practices in the scientific excellence criteria of their proposals (European Commission, nd) meaning that progression in open science is part of the evaluation of the proposal. Horizon Europe also requires Data Management Plans for their projects, which prepare researchers to share all the different types of outputs of their research projects. This increased focus on open science practices by funders is likely to grow in the coming years, and should draw the attention and support of management for any activities that mean to increase the awareness of them in your institute.

To stimulate participation in the team, it can be helpful to consult with potential team members to see what they hope to gain through their participation. This includes, offering 'credits' of some kind for PhD candidates which they can use in their educational modules of their PhD projects, ensuring that they receive compensation for their involvement. Another example would be the opportunity to contribute to visible outputs, such as a final report (TNW, 2023), a GitHub repository (Meindlhumer & Plomp, 2023), or a recipe like this. This compensation may look

different for team members, depending on their backgrounds, ambitions and needs.

Consider developing a survey to be used before the first team meeting. This survey will help in assessing individual team members' perspectives, strengths, and requirements. For example, if team members need more information on a certain aspect of open science you can already prepare and accommodate for this before the first meeting. This initial input via the survey will be invaluable in shaping the scope of the team's mission, as well as the milestones to be achieved. Be prepared to adapt mission and goals based on ongoing feedback from team members. Thanks to the survey that our team conducted it was possible to quickly align the various degrees of team member's expertise regarding open science (most team members had not heard of topics such as 'preregistration' or 'open hardware'), and then move to the areas that were of most interest to team members— such as open access, open data, open software. We used team members' responses to a survey question—What would a successful open science team accomplish?— to articulate the team's mission: The open science team works together to inventories the requirements of researchers so that they can engage more successfully with open science practices.

It will be helpful to familiarize yourself with cultural change theory, as your team's ultimate goal is to change your institution's culture around open science practices (figure

1). Consider enrolling in a course on cultural change, or explore resources like Kotter's 8 Steps for Leading Change (Kotter, 2012) or The Turing Way's section on cultural change (Turing Way Community, 2022). This knowledge will equip you with the insights and tools necessary to more effectively support the open science team.

COOKING METHOD

1. Seek out support from leadership.
2. Assemble team members. Approach individuals who share your passion for open science and are willing to contribute their time and expertise to the cause. Consider diversity in expertise and perspectives to ensure a well-rounded team. This recruit-

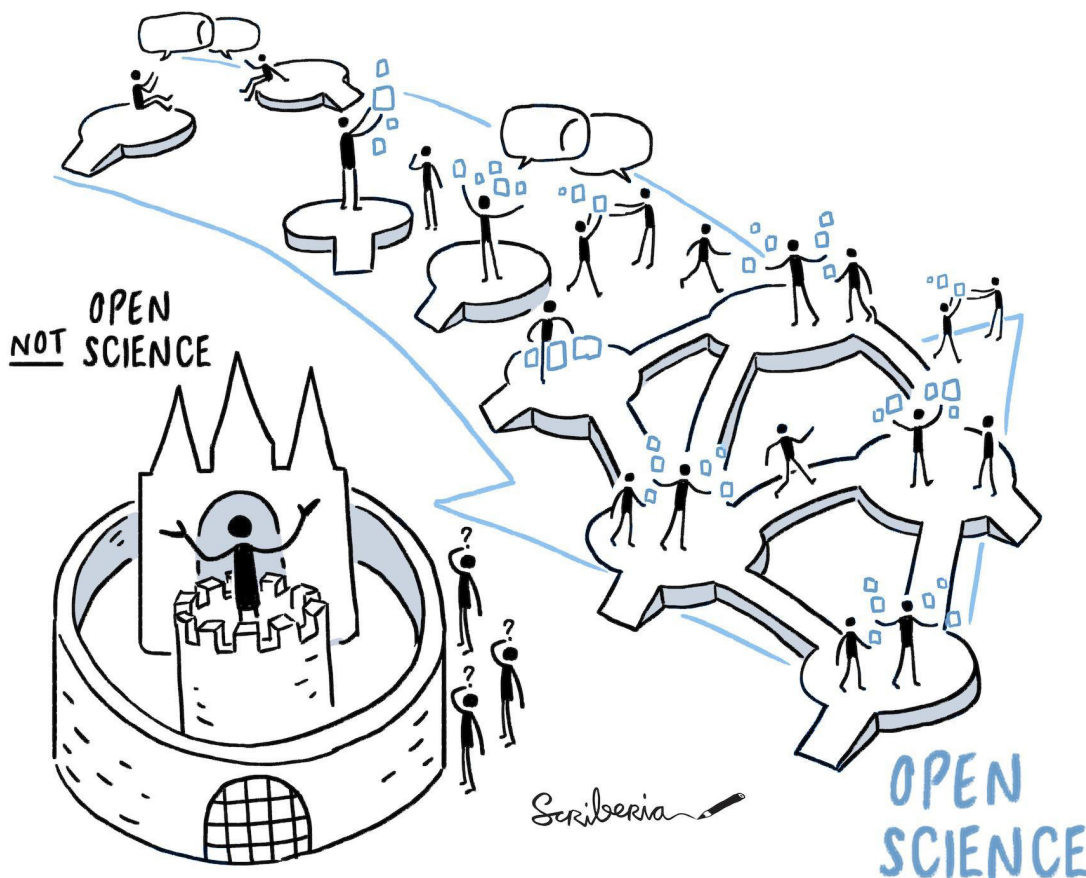


Figure 1. Graphic illustration of Open Science principles. Image adapted from an illustration created by Scriberia with The Turing Way community, used under a CC-BY 4.0 licence. DOI: 10.5281/zenodo.3332807.

ment process may take some time as you identify and engage potential team members.

3. Schedule the first meeting; make sure all team members are able to attend so that everyone is introduced to one another.
4. Create and send a survey to get to know the needs and ambitions of team members and to prepare an agenda for the first Team meeting. You may have to remind team members to fill out the survey.
5. During the first team meeting, refine the goals/scope of the team and establish objectives. Estimate how many more meetings will be needed for the team to achieve those goals and milestones. (Our open science team held four meetings per academic year.)
6. Reach out to stakeholders outside of the team. Our team connected with other groups at the university interested in open science practices (such as the Data Champions and Open Science Community).
7. Set up an evaluation meeting to consider what milestones and goals are reached. If there are remaining objectives to be achieved, they may be accomplished in a future round of the team.
8. Report back to leadership on the team's

progress to keep open science on the agenda and solidify support for the team and its activities.

9. Restart a new round of the open science team for the new academic year.

CHEF'S NOTES

We recommend planning meetings one to two months in advance to accommodate for team members' busy schedules (particularly those of more senior researchers). When it is not possible to find a time and date that works for everyone, you can take notes during meetings, to be shared with the entire team, and follow up with any absent team members to get their feedback and input.

In addition to planning ahead, communication is key. It is crucial to have well-defined goals and to communicate them clearly, along with any associated activities and deadlines. Team members will be more motivated to engage if it is clear how they can contribute (by providing them with a draft idea, agenda or text in advance), and in what time frame they should provide input. Ensure that team members have at least a week to provide feedback. Don't hesitate to send re-

mindings or solicit follow-up feedback if initial responses are limited.

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