

Diffuse phosphorus input to surface waters
- new concepts in removal, recycling and management -

Transferable Skills Training Course (TSTC) 1

- Being a scientist in the 21st century -

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Deliverable D4.1

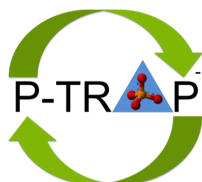
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1. General overview

The first training course of P-TRAP (TSTC1 - Being a scientist in the 21st century) was held in association with the 1st Annual Meeting in Bayreuth, Germany in January 2020. Both, the training and the meeting was hosted by UBT.

The initial planning was to hold the training course in project month 9. Due to the late start of several ESRs the training schedule had been slightly re-arranged (agreed on during the 1st P-TRAP teleconference, held 17th of July 2019), and the TSTC1 was shifted to project month 11.

The aim of TSTC1 was to prepare the ESRs for their upcoming function as Early Stage Researcher, being a role model for a scientist operating in a diverse research environment and to bear societal responsibility, as excellence in research alone does not suffice to guarantee the ESRs' success in the future and does not fulfil society's expectation on scientists.

Specific emphasis was given to communication skills and ethical topics such as research integrity. As this training was the first occasion for the ESRs to meet in person, a dedicated icebreaker session was implemented. During this icebreaker the ESRs had the opportunity to get to know each other in an informal way. Furthermore, the course assisted the ESRs in identifying their training needs and the opportunities within P-TRAP to achieve their learning goals. This was also in the context of the Career Development Plan discussions, which took place during the associated 1st Annual SB Meeting afterwards.

Next to the theoretical part, TSTC1 also included an excursion to the waste water treatment plant of Bayreuth as practical part in the context of P-TRAP.



Fig. 1: Participating ESRs, **Row above (from left to right):** Victoria Barcala (ESR3, DELTARES), Ville Nenonen (ESR7, EAWAG), Ming-kai Ma (ESR6, UU), Rouven Metz (ESR10, UNIVIE), **Row below (from left to right):** Karel As (ESR9, UBT), Tolulope Ayeyemi (ESR8, US), Rochelle Saracanlao (ESR2, KULeuven), Melanie Münch (ESR11, UU), Oleksandr Bolielyi (ESR4, GEOS)

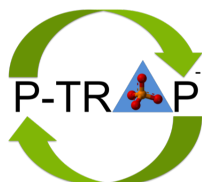
2. Participants

The TSTC1 was postponed about two months to ensure, that all ESRs can participate. Unfortunately, two were unable to attend: ESR5 due to visa issues, and ESR1 resigned because of personal reasons on short notice. Otherwise the ESR group was complete (see Fig. 1).

3. Preparation

The training course was mainly organized by UBT, with support from the UU. The overall idea and content of TSTC1 was already part of the proposal, and the consortium decided during the Kickoff Meeting in March 2019 about the date. The more detailed preparation started in June 2019. It was continuously further developed, and the consortium was kept up-to-date during the regular tele-conferences.

There was no specific preparation in advance required from the ESRs for this training. No ECTS points are given for this training event.







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4. Agenda

In December 2019 the ESRs were informed about the final agenda via email.

Table 1: Agenda TSTC1

| Monday, 06 January 2020 – TSTC1: Being a scientist in the 21 st century (D4.1) | |
|--|---|
| 15:00 | Check in Youth Hostel Bayreuth |
| 16:00 | Welcome and Icebreaker |
| 17:00 | Research Integrity |
| 19:00 | Joint dinner, Restaurant Oskaer |
| Tuesday, 07 January 2020 – TSTC1: Being a scientist in the 21 st century (D4.1) | |
| 9:00 | Excursion Waste Water Plant |
| 12:30 | Workshop - Doing a successful doctorate right from the beginning Lecturer: Dr. M. Schwarzkopf (Karriereberatung-akademiker.de) Between 30 and 50 % of all PhD students in Germany do not finish their doctoral theses. There are many reasons for that, but most of them can be eliminated: if you have done a master's or similar degree with good results you will be able to finish a PhD too. In this workshop you will learn how to focus as early as possible on finishing your PhD. The workshop covers the following topics: <ul style="list-style-type: none">  Common challenges of a PhD and how to overcome them  How to define and set goals and how to do self-management  How to motivate yourself and how to deal with demotivation  How to structure work and writing process |
| 16:30 | Coffee break |
| 17:00 | P-TRAP Data management (D5.5) – Workshop on how to organise your data and share them within the consortium (Stefan Holzheu, BayCEER) |
| 19:00 | Dinner |
| Wednesday, 08 January 2020 – TSTC1 & 1 st Annual Meeting | |
| 8:30 | Workshop – Potential and challenges of international cooperation Lecturer: M.Sc. K. Mägele (BayFor) This interactive workshop highlights the potentials and challenges of international cooperation. Participants will gain knowledge about concepts of intercultural communication, enhance their awareness for stereotypes and prejudices in an intercultural context, improve their understanding of their role in such an environment and discuss pitfalls of international cooperation. |
| 12:30 | Lunch |
| 13:30 | Start P-TRAP 1 st Annual Meeting |

5. Sessions

5.1 Icebreaker

The icebreaker was an informal session for the ESRs. As this training was the first meeting in person, the session contained several interactive and communicative networking games giving the ESRs the opportunity to get to know each other better and foster future collaboration.

5.1.1 People organiser

This game is a typical team-building icebreaker game to start communication within the group. The ESRs stood in the middle of the room and had to organise themselves in a row according to certain criteria such as e.g. the degree of longitude of their home country, alphabetical orders of names or number of spoken languages.



Fig. 2: ESRs organising themselves, here by their place of birth from south to north

5.1.2 The LEGO® challenge

The goal was to build a LEGO® figure. The challenge was that the group was divided into two teams, and each team again was divided into a building and an instructing team. The building team got the bricks, the instructing team the instructions. The teams were separated spatially, communication between them was only allowed via mobile phone and verbally without sending pictures. The objective of the game was to get an idea about purposeful and solution-oriented communication. ESRs got also an impression of working together as a team within some constraints, dealing with their own personalities and find compromises in case of different opinions.

5.1.3 Building challenge

The ESRs were divided into two groups. Each group got dry spaghetti and marshmallows as building material. The challenge was to build a high and stable tower within a given time, at least higher and more stable than the other group. Games like this enhance creative and collaborative thinking and give first insights in possible group dynamics.



Fig. 3: ESRs during the Building challenge and presenting the result



5.2 Research Integrity

Research integrity is indispensable to trust science and scientists. However, there are lots of pitfalls, which are not really obvious. Following the [European Code of Conduct for Research Integrity](#)¹, good research practices are based on fundamental principles of research integrity. These principles are reliability in ensuring the quality of research, honesty in developing and communicating research and results, respect for people and environment, and accountability for the research in general. Depending on the Codes of Conduct, the principles can differ a bit, e.g. the [Netherlands Code of Conduct](#)² defines five principles: honesty, scrupulousness, transparency, independence and responsibility. However, the Codes are similar in essence, and the ESRs were briefly introduced to the topic. They discussed some very typical cases of violated research integrity which happened recently, and how to deal with daily temptations of scientists, e.g. cherry picking of data (Fig. 4).

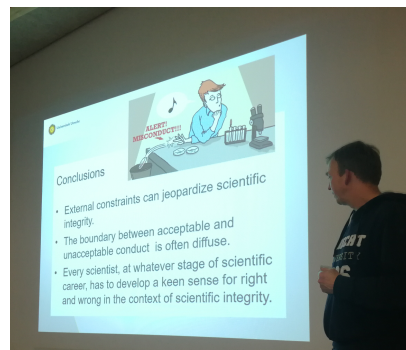


Fig. 4: Thilo Behrends introducing the topic of Research Integrity to the ESR group

5.3 Wastewater Treatment Plant Bayreuth (Excursion)

One aspect of P-TRAP is to investigate the options of using Fe and P containing by-products from water treatments, e.g. by converting them into marketable fertilizers or stabilize P in lake sediments. As a practical part of the workshop and in the context of P-TRAP the ESRs visited the wastewater treatment plant of Bayreuth.

The plant is the largest in Upper Franconia. It collects domestic and industrial waste water, serving about 220.000 people equivalent and cleaning up to 100.000 m³ wastewater per day. The plant has a complete treatment line, including e.g. fine mechanical traps, three stage biological reactor with phosphorus and nitrogen removal, and precipitation to enhance the removal of phosphorus. The sludge from settlers is used to produce around 13000 kWh electrical energy in two anaerobic reactors. The remaining inert sludge is dried and finally incinerated. Due to the expected short-comings of P in the next century and the legislations request to reduce the phosphorus content of the sludge by 50 %, P-TRAP can significantly contribute to the re-cycling and help to prevent wasting P.



Fig. 5: ESRs visiting the waste water treatment plant in Bayreuth (from left to right): Lothar Ziegler (head) giving a first introduction, incoming wastewater, walk along the P/N treatment basin, sludge desiccation by solar energy

5.4 Doing a successful doctorate right from the beginning

This workshop was given by Matthias Schwarzkopf (www.karriereberatung-akademiker.de). He introduced the ESRs to topics which are – next to the scientific part - of high importance for the success of a PhD. The program included i.a. setting goals and how to (time)manage them, effective communication with supervisors and to find out what are motivating or demotivating aspects and how to use, respectively to overcome them.

¹ European Code of Conduct for Research Integrity: https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/h2020-ethics_code-of-conduct_en.pdf

² The Netherlands Code of Conduct for Research Integrity: <https://www.nwo.nl/en/policies/scientific+integrity+policy/netherlands+code+of+conduct+for+research+integrity>

The ESRs learned the theoretical basics such as working with SMART goals or the Eisenhower-Analysis to define and decide on task priorities. They discussed how they can organise their working days and exchanged ideas for more efficient structures and long-term goals. As motivation plays a crucial role in reaching targets, the ESRs were introduced to the Maslows hierarchy of needs and questioned their own motivation and wishes for doing a PhD. This exercise was especially useful for drawing up the Career Development Plan, which was prepared in advance and discussed during the 1st Annual SB Meeting (deliverable D5.6).

Next to motivation also supervisors and colleagues have a significant impact on a PhD. Defining your own needs is the first step, but it is also important to adequately communicate them. An open and fair communication is fundamental, and it is necessary to remind that also supervisors are humans and not omniscient.



Fig. 6: Matthias Schwarzkopf starting from (vague) expectations, defining of ESR needs and motivation structures and set the principles of successful communication with supervisors

5.5 Data management

Data management (DM) is imbedded in deliverable D5.5 (Data Management Plan). As the ESRs are the ones mainly executing the tasks related to this topic, the deliverable was postponed to involve them adequately. During the training course, the ESRs got a first introduction to the importance of high-quality data management, not only for the project with respect to its participation in the Pilot on Open Research Data, but also for themselves, their projects and collaboration within and outside the project.

Stefan Holzheu from our partner organisation BayCEER demonstrated the need for a good organised data management and also storage strategies. He showed how BayCEER can contribute to this and which options could be used.

This topic was continued during the 1st Annual SB meeting to involve the consortium as a whole (for more details see D5.6).



Fig. 7: Stefan Holzheu (BayCEER) demonstrating the need for adequate DM

5.6 Potential and challenges of international cooperation

P-TRAP is an international EU project, each ESR is coming from another country, with a different personal and cultural background. Intercultural collaboration depends on several aspects, and not all of them are clearly visible. Its one's understanding of the culture, the social interactions, and cultural accommodation, which also contributes on how successful people can communicate and collaborate.

During this interactive workshop – given by Katrin Moegle from our partner organisation BayFor - the ESRs were introduced to the potentials and challenges of international cooperation. Aspects influencing the communication and cooperation are distributed like a floating iceberg, some are obvious like cloths or geography, but most of them are hidden, e.g. taste, attitudes, beliefs or values.



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The ESRs gained knowledge about concepts of intercultural communication, enhanced their awareness for stereotypes and prejudices in an intercultural context and improved their understanding of their role in such an environment. The discussion about pitfalls within intercultural communication enhanced their ability to respond to others and percept someone's expectations. Those skills are not only important while involved in the project, but also afterwards.



Fig. 8: Impressions of the workshop "International collaboration" given by Katrin Moegele (BayFor)

6. Evaluation

The ESRs were provided with templates to evaluate the individual lectures and also the whole training course, including the practical part and miscellaneous items such as accommodation, catering and networking. The feedback was anonymous.

Fig. 9 shows the mean evaluation of the TSTC1, ranking from 1 (not satisfying) to 4 (good). The overall mean ranking was 3.4 ± 0.7 ($n=9$, vertical green line, Fig. 9). The ESRs evaluated separately the course in general, the theoretical and practical part, and the miscellaneous activities.

Several ESRs gave individual comments, which will be considered for the organisation of future events. The overall results and the individual comments clearly show, that the event in general was highly appreciated by the ESRs and experienced as interesting and useful network event for their projects and personal development.

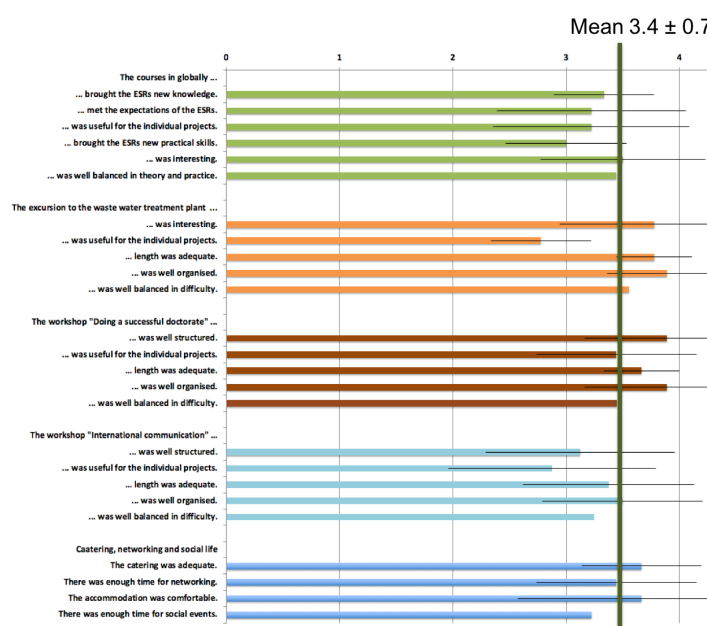


Fig. 9: Evaluation of the training event in total. The overall evaluation mean (vertical green line) is 3.4 ± 0.7 , $n=9$.

7. History of TSTC1

| Date | Author(s) | Actions / Changes |
|---------------|-----------|--|
| March 2019 | | Fixing date of TSTC1 during the Kickoff Meeting |
| June 2019 | UBT | Venue and accommodation organised |
| | UBT | Organising workshop lecturers |
| November 2019 | UU / UBT | Preliminary agenda and additional information sent to consortium |
| January 2020 | | TSTC1 held in Bayreuth, hosted by UBT |