

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

TSTC2

- E-learning modules as dissemination channels –

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Deliverable D4.3

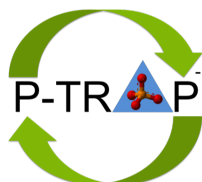
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Table of contents

1. General overview	3
2. Organisation and content of TSTC2.....	3
3. Participants.....	5
4. History of the deliverable	5

1. General overview

This Transferable Skills Training Course (TSTC) was dedicated to the development of e-learning modules on biogeochemical dynamics of Fe and P in aquatic environments for different target audiences. Due to the Corona pandemic the course, initially planned to be held in Utrecht from 8 -11 July 2020, was organised remotely in collaboration with the Training Centre for Higher Education at the University of Bayreuth (UBT) (Fortbildungszentrum Hochschule, FBZHL) and spread over 2 months from mid-May till mid-June 2020. The technical development of the modules was supported by tutors of the FBZHL and the e-learning modules are hosted by the e-learning platform of the University of Bayreuth.

The e-learning modules are supposed to be part of the outreach activities of P-TRAP but the main objective was to train the ESRs in conveying their knowledge to different type of audiences (not experts) and to improve their didactic skills. Furthermore, the activity should contribute to the community building within the group of ESRs and enforce the interactions among them.

In total 4 modules were developed, of which one was sufficiently advanced for publication at the end of the course. The module, a general introduction of the project to the broader public, was presented as a show-case during the EU Progress Review Meeting (15 July 2020).

It is available on the project webpage (<https://h2020-p-trap.eu/2020/09/01/our-first-e-learning-module/>). A blog about the e-learning webinar is also available (<https://h2020-p-trap.eu/2020/06/12/transferable-skills-an-important-part-of-our-training-network/>).

The remaining three modules will be reassessed during the TSTC4 (Open science and communicating out of the ivory tower), which is scheduled for project month 24, hosted by KULeuven.

2. Organisation and content of TSTC2

The course started for the ESRs with a first concept meeting introducing the aim and organisation of it. They met remotely with the coordinator (Thilo Behrends, UU) and the training coordinator (Stefan Peiffer, UBT), using MS Teams as platform (11th of May 2020, Table 1).

Table 1: Preliminary schedule of TSTC2

	Activity	Description
11 May 2020	Meeting coordinators and ESRs	Introduction to the planning of the TSTC2
11 - 22 May	Meetings ESRs	Forming groups, selecting subjects and target audiences
19 May	Meeting coordinators and ESRs	1 st Progress meeting to evaluate the developed ideas and concepts
26 May	Webinar	4-hours webinar given by the FBZHL to teach the technical and didactical aspects of e-learning
1 June - 15 July	Development and production of e-learning modules by the ESRs	Self-organised production of the e-learning modules, supported by the coordinators and the mentors of the FBZHL
9 June / 30 June	Progress meetings coordinators and ESRs	Check the progress of the production and support where necessary
15 July	Presentation and publishing of e-learning modules	Show-case presentation of at least 1 e-learning module during the EU Progress Meeting

The ESRs were asked to organise themselves in four groups of 5 / 6 ESRs, and each ESR participating in two groups. The idea was to compose the groups as different as possible to maximize the exchange among ESRs. After the concept meeting the ESRs started developing ideas and concepts of modules (Fig. 1) for different audiences. The e-learning modules were planned to be developed for two different target groups: professionals from stakeholders of P-TRAP research (e.g. farmers, water authorities, fertilizer companies, etc.) and pupils or students (high school or higher education).

Ideas for possible subjects for stakeholders included e.g.

- ⊗ How could adding Fe improve the water quality of lakes?
- ⊗ Can vivianite be a fertilizer?
- ⊗ How can the P export from drained agricultural areas be reduced?

For educational purposes possible subjects were e.g.

- ⊗ What is eutrophication and why does phosphate play an important role therein?
- ⊗ How did humans change the global phosphorus cycle?

The ESRs should get a feeling for the needs of different target audiences, what are attractive topics, and how to reach them. Considerations were e.g.

- ⊗ What do I want to show, and to whom?
- ⊗ What has already been done?
- ⊗ What is needed and wished?
- ⊗ Can I use material which is already available or do I want to prepare something on my own?
- ⊗ What type of presentation do I want to use?
- ⊗ What is the take home message?
- ⊗ How should the content be conveyed?

Two weeks later the ESRs presented their ideas and concepts during a first evaluation meeting and discussed their planning together with the coordinators (19th May 2020, Fig. 2).

Group Name	Subject	Participants	Topic	Target Audiences	E-learning format
Group 1	Educational	Xingyu (1), Victoria (3), Lordina (5), Ville (7), Karel (9), Melanie (11)	Catching before reaches the ocean	High school students	Video+quiz
Group 2	Educational	Rochelle (2), Oleksandr (4), Mingkai (6), Tolulope (8), Rouven (10)	Phosphorus cycle, issues and the ways of solution	High school students	Quiz+video
Group 3	Agricultural	Xingyu (1), Rochelle (2), Victoria (3), Lordina (5), Rouven (10)	Cheap, efficient and sustainable ways to prevent excessive P leaching	Farmers	Videos(multi-languages)
Group 4	Lakes & Mechanistic study	Oleksandr (4), Mingkai (6), Ville (7), Karel (9), Rouven (10), Melanie (11)	The potential of recycled Fe-materials for trapping P in eutrophic lakes	Authorities and Industries	Fact sheet/video

Fig. 1: Overview of groups and envisaged topics and audiences of the modules

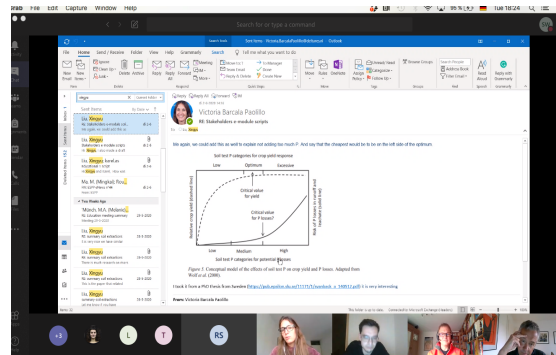


Fig. 2: Impression of the evaluation meeting

The first phase of conceptual developing was followed by a webinar on e-learning, given by the Training Centre for Higher Education at UBT (Fortbildungszentrum Hochschul-lehre, FBZHL, Fig. 3, 4).

During the webinar, the ESRs were introduced to various e-learning elements and didactical aspects of e-learning, and started to build the technical framework of their e-learning modules. The team of the FBZGL was also the technical contact point for the ESRs in case of questions.

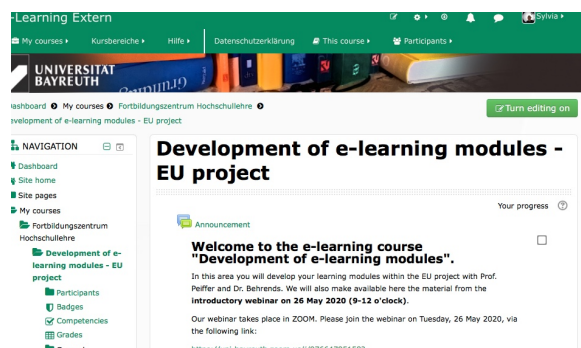


Fig. 3: E-learning platform of the FBZHL

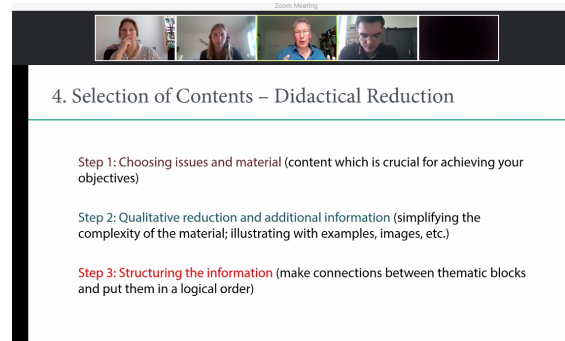
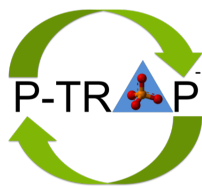


Fig. 4: Didactical part of the webinar on e-learning



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D4.3 – TSTC2

After the webinar the ESRs had 6 weeks to produce their e-learning modules, including the final preparation of scripts, selection of contents and collection of materials. During this time, they were supported on demand by the coordinators and the mentors of the FBZHL and two progress meeting were held (9th and 30th June 2020, Fig. 5, 6).

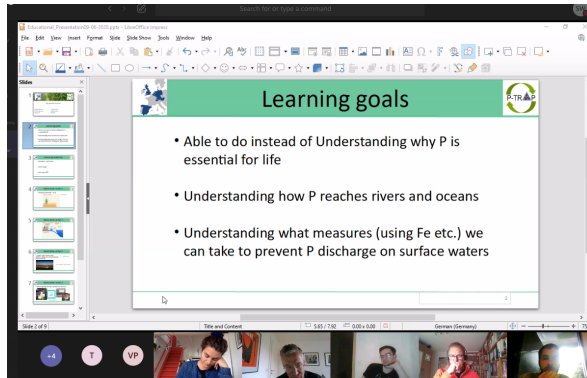


Fig. 5: Definition of learning goals for one of the modules

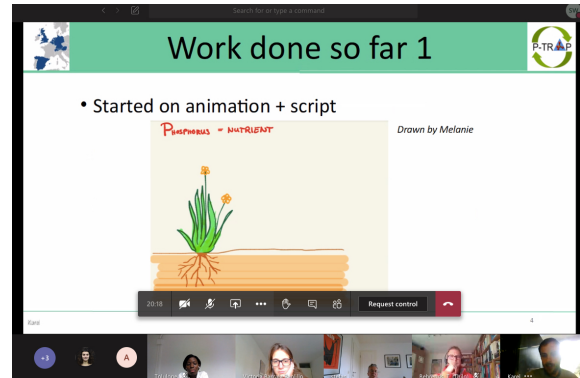


Fig. 6: Demonstrating the progress so far during a remote meeting

One of four modules was sufficiently advanced for publication at the end of the course and was presented as a show-case during the EU Progress Review Meeting (15th July 2020). It is available on the project webpage <https://h2020-p-trap.eu/2020/09/01/our-first-e-learning-module/>.

3. Participants

All ESRs were actively involved and participating in the course (Fig. 1).

4. History of the deliverable

Date	Actions / Changes
February 2020	Coordinators' meeting to develop the conceptual structure of the deliverable
February – March 2020	Local organisation (venue / accommodation) of the course
April 2020	ESRs informed about the organisational change to a remote course due to the pandemic
May 2020	Introduction meetings coordinators and / or ESRs
26 May	FBZHL Webinar
June - July	Development and production of e-learning modules by the ESRs
9 June / 30 June	Progress meetings coordinators and ESRs
15 July	Presentation and publishing of e-learning modules