D2.3 Concept for training (and attracting) the "EuroTeQ Learning Professional"

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EXECUTIVE SUMMARY

This report presents Deliverable D2.3 of the BoostEuroTeQ work package 2 (WP 2) "Define EuroTeQ Learning Professional". It aims to provide a joint concept to attract and train the "EuroTeQ Learning Professionals" (also referred to as Experts for Learning and Professional Development; in short: Experts for L&PD) at the EuroTeQ partner universities.

The present Deliverable is based on the defined Qualification Framework for the EuroTeQ Experts for L&PD (Deliverable D2.2) which explains the tasks associated with the role and the necessary competences. In short, the EuroTeQ Experts for L&PD are to be specialists in the scientific upskilling of engineers and are responsible for the facilitation of knowledge transfer and co-creative innovation activities between the EuroTeQ partner universities and industry. The Qualification Framework (D2.2) outlines relevant competences of Experts for L&PD in the areas of specialized-methodological, social-communicational, personal, and activity and realization-oriented competences and formulates central learning outcomes, specifically focusing on specialized-methodological and social-communicational competences which are considered most important for the qualification of Experts for L&PD within EuroTeQ.

The concept for training the "EuroTeQ Learning Professional" described in the present Deliverable builds on previous related work at TUM which was further developed in several feedback rounds with experts from the EuroTeQ partner universities. The resulting concept for training the "EuroTeQ Learning Professional" consists of two main elements accompanied by peer mentoring, guided reflections and application tasks: (a) a comprehensive online learning environment that is the core of the training program focusing on specialized-methodological competences and aims to equip participants with the basic knowledge and skills regarding professional education (e.g. content development, instructional design) and (b) an on-site Bootcamp that focuses on social-communicational competences and aims to equip participants with the relevant knowledge and skills in the areas of science communication and public impact, involving practical exercises, networking and (interdisciplinary) cooperation with participants.

The training concept described in the present Deliverable additionally includes ideas for how to attract potential participants at the EuroTeQ partner universities to the training program via various channels. Moreover, it outlines project-specific indicators to evaluate the success of the training program, specifically the planned pilot activities.

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1. INTRODUCTION

Previous activities in the BoostEuroTeQ Work Packages 2 (WP 2: Learning Professional) and 3 (WP 3: Upskilling Strategy) have shown the relevance of so-called "Learning Professionals" (also referred to as "Experts for Learning and Professional Development"; in short: "Experts for L&PD"). There is an increasing need for specialists in the scientific upskilling of engineers that facilitate knowledge transfer and co-creative innovation activities between universities and industry. To address this need, the present Deliverable provides a joint concept to attract and train "Learning Professionals" at the EuroTeQ partner universities.

The training program for the "EuroTeQ Learning Professional" is based on the Qualification Framework defined in Deliverable D2.2. The Qualification Framework outlines relevant competences required to function as a specialist in the scientific upskilling of engineers and to facilitate knowledge transfer and co-creative innovation activities between the EuroTeQ partner universities and industry (which are the main tasks of the Experts for L&PD). The most relevant competences concern specialized-methodological competences (e.g. the assessment of professionals' developmental/learning needs, didactics and adult pedagogy and the use of educational technologies) and social-communicational competences (e.g. audience-tailored communication and interdisciplinary cooperation). In addition, the Qualification Framework (D2.2) formulates central learning outcomes, specifically focusing on these specialized-methodological and social-communicational competences, which provide a guideline for the concept of a training program that is presented here.

The present Deliverable is structured as follows: First, the structure and the content of the training program are described (Chapter 2), including a comprehensive summary of the background and methodological framework and a detailed insight into the main elements of the training program, namely an online learning environment (focusing on specialized-methodological competences; i.e. knowledge and skills regarding content development and instructional design in professional education) and an on-site Bootcamp (focusing on social-communicational competences; i.e. knowledge and skills in the areas of science communication, public impact, and interdisciplinary cooperation). Chapter 3 then outlines the approach how potential participants of the training program will be attracted at the EuroTeQ partner universities. Lastly, central criteria for evaluating the pilot run of the training program are provided in Chapter 4 before Chapter 5 closes with an outlook on the upcoming pilot activities for the training program within BoostEuroTeQ.

2. STRUCTURE AND CONTENT OF THE TRAINING PROGRAM

2.1. Overview: The training program in a nutshell

The training program for "EuroTeQ Learning Professionals" is aimed at researchers and teaching staff at the EuroTeQ partner universities (TUM, TalTech, CTU, DTU, TU/e, L'X) with at least 1-2 years of experience in research and teaching who want to expand and deepen their cross-disciplinary skills to work at the intersection of academia and industry, specifically in the scientific upskilling of engineers.

The program is designed to be as flexible and demand-oriented as possible. Many individual program elements can be customized to the needs and requirements of participants. The training program provides for synchronous as well as asynchronous learning phases, both online and on-site. There are two main elements (a comprehensive online learning environment and an on-site Bootcamp), accompanied by peer mentoring, guided reflections and an application task. The program language is English.

Element I: Self-paced online learning

The online self-study element is the core of the training program. It focuses on specialized-methodological competences and aims to equip participants with the basic knowledge and skills regarding professional education (e.g. content development, instructional design) as well as expertise about current trends and developments in these areas. For the self-study element, selected materials in different formats that meet scientific quality standards are made available in Moodle.

Element II: On-site Bootcamp

The on-site element (~ 3 days) focuses on social-communicational competences and aims to equip participants with the relevant knowledge and skills in the areas of science communication and public impact, involving practical exercises, networking and (interdisciplinary) cooperation with participants from a TUM internal qualification program for scientific staff.

Accompanying elements: Peer mentoring, guided reflection and application task

- Participants get to reflect on and share their experiences, give advice and support each other in peer groups.
- In the application task, participants in the program get to apply the learning content and develop their first concept for an upskilling program for professional engineers, supported by structured guidance (synchronous check-in sessions).

2.2. Background and methodological framework

The central topic areas that constitute the training program for the "EuroTeQ Learning Professionals" (i.e. EuroTeQ Experts for L&PD) and general ideas about how to deliver the training were identified in the interviews conducted in the scope of defining the Qualification Framework for the EuroTeQ Learning Professional (see D2.2), and considering the already existing "Learning Professional" training program at TUM. From a methodological perspective, the training concept uses the comprehensive experience of the TUM (specifically the TUM Institute for Lifelong Learning and the Professorship of Technical Education for from comparable projects and the approaches developed there. These conceptual ideas for the training concept were then further developed in several feedback rounds with experts from the EuroTeQ partner universities, resulting in the version presented in this deliverable.

Notably, the methodological framework for the training concept presented here is based on a structure that has already been extensively tested in vocational and higher education (specifically in the work of Daniel Pittich, TUM, EuroTeQ WP 4 Professional). Central to the concept of the training program are the didactic ideas of vocational qualification and professional education, which differ from other school or university qualification formats, not only because of the existing expertise and the professional activities of the learners. The core idea here is "contextualization", that is the learning-related use of professional contexts and the workplace reality. The learning environment is then to be seen as a learning space (in terms of content, didactic methodology and structure) in which learning contents are made available and applied to the concrete challenges of professionals. This not only brings motivational gains for the participants and ensures a transfer and immediate application of what has been learned, but at the same time allows for participation in the training program while having a full-time job and guarantees a balanced and yet flexible workload over the entire course period while simultaneously achieving the learning goals. Figure 1 below shows the structural set-up with the core elements in different topic areas, the application task, peer feedback and reflection as well as working and supporting materials. These core elements will be described in more detail in the following.
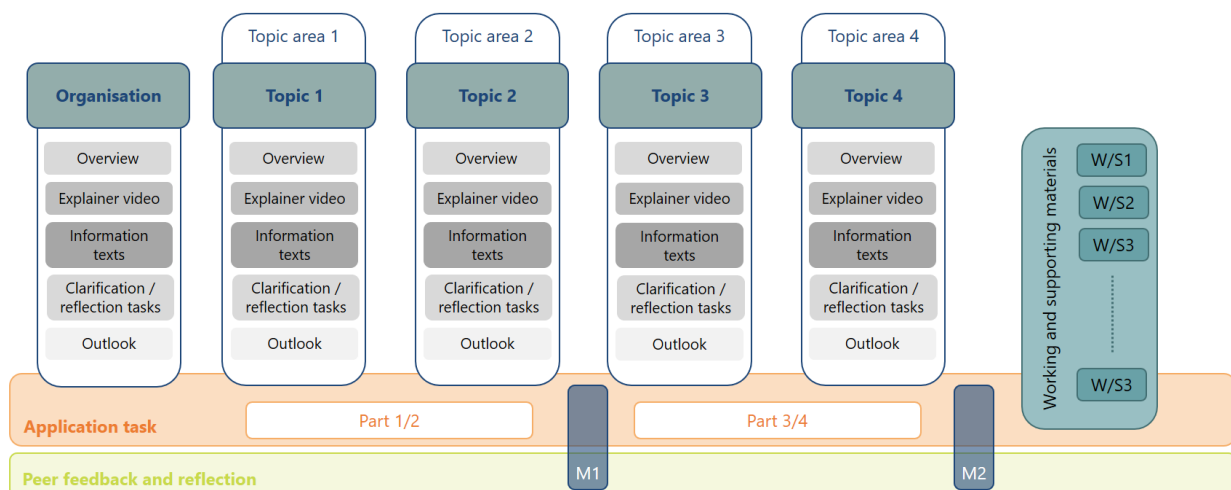

Figure 1. Structure of the online learning element and its core elements (topic areas, application task and peer feedback and reflection). In addition, there are organizational information and supporting materials.

Topic areas focus on one specific topic each. They are made up of a thematic overview (addressing the learners, providing context and instructions for working through the topic area, explaining the upcoming tasks, reflective approaches and solution framework), and information texts and explainer videos for the online self-study element. For the on-site element, the written information and explainer videos are replaced with suitable formats for in-person teaching and learning (e.g. short keynotes, presentations and written hand-outs). In more detail, the following elements are included in all of the topic areas:

- In the *thematic overview*, first, the content of the respective learning area is outlined in order to create transparency regarding the addressed competences. Second, context is provided as a localization that enables participants to link the topic to individual (prior) knowledge and facilitates repetition and reviews to highlight connections between different topics.
- The *information texts* and *explainer videos* define the main learning content and present the substance of the topic. The information texts present the learning content in the form of reading assignments, the explainer videos present the same information as the reading assignments as a supplement in another format for motivation.
- There are *clarification tasks* in the form of multiple-choice questions and similar formats that support learners in working with the learning content presented in the readings and videos.
- The *questions for reflection* address the central aspects of the topic application in relevant contexts in varying degrees of difficulty and encourage (peer) feedback on the individual learning status.
- In the *outlook*, a short summary of the topic is given and it is explained what learning progress has been made with this topic area. The outlook links the topic area to the application task and facilitates repetition and reviews to highlight connections between different topics.

The **application task** forms the practical-reflective implementation space embedding the learning contents of several topic areas. In the application task, the newly gained knowledge must be transferred step by step into relevant application scenarios. All relevant working and supporting materials required for this are provided in the learning environment and can be used individually and as needed. The training concept thus applies a self-regulated competence development and lays the basis for the effectiveness of the training as the probability of actual use of newly acquired competences increases with an individual implementation related to the training.

The application task is directly linked to the concept of **peer feedback and reflection**, so that participants receive explicit process- and result-oriented feedback throughout the entire learning experience. Feedback is provided through different forums in the online learning environment that enable a continuous exchange between participants and trainers. There are designated milestones (exemplary M1 and M2 in Figure 1) that bundle related topic areas and function as an orientation for result-oriented feedback and reflection on the learning content.

2.3. Training program element I: Self-paced online learning

The online self-study element of the training program will be designed as a Moodle course which is made accessible to all participants across the partner universities. The Moodle course will be structured along the methodological framework described before (see Figure 1) and is the core of the training program.

Main learning objectives in the online learning environment

- Understanding the specificities of professionals as adult learners (in particular in comparison to higher education at universities aimed at university students) and the core elements of successful competence development for professionals
- Being able to formulate competence-oriented learning goals for the own subject domain based on the different types of knowledge that professional learners should acquire
- Understanding basic principles of learner-centred training concepts and being able to connect the didactic-methodological knowledge to certain learning goals and specific formats of instructional design
- Understanding the intentions and effective instructional design of on-site vs. hybrid vs. online learning environments and being able to assess their fit with certain learning goals

Learning content in the online learning environment

At the centre of the online learning element of the training program is the question of how the acquisition of professional competences can be initiated and promoted. The central topic areas (see Figure 2) deal with different facets of adequate learning situations or learning contexts of professional learning, which focus on an open but at the same time clearly competence- and implementation-oriented approach that centres around the learners (with their professional reality and their development needs) and their learning process (directed towards corresponding learning outcomes).
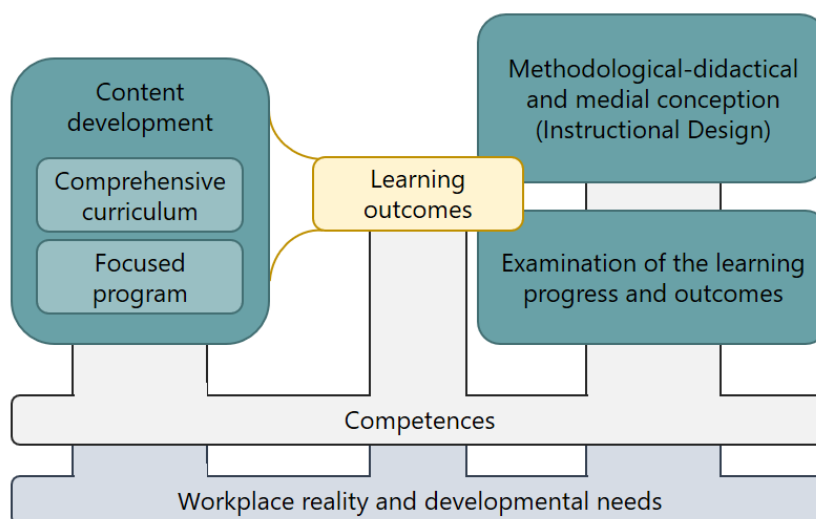

Figure 2. The three topic areas of the training program for Learning Professionals, connected by the topic of "competence-oriented learning outcomes"; all learning contents refer to competences according to learners' workplace reality and development needs.

Depending on participants' background, the relevance of the different topic areas varies. For example, the content development of a comprehensive curriculum and the development of corresponding assessment formats for the learning progress and outcomes are less central when learning professionals develop a continuing education course for a specific company; here, the methodological-didactical and medial conception (Instructional Design) is most relevant. The online training program element counters this with its modular structure, which enables learners to work in-depth on the content that is most relevant for them.

Topic areas in focus in the online learning environment

Three central topic areas were identified for the online learning environment (see Figure 2):

1. *Content development*

   Depending on the respective target group for which a program/curriculum is to be developed, participants can chose from different tracks in this topic area, focusing on (a) the requirements of a competence-oriented curriculum and the basic principles of creating one, and (b) the criteria of a successful more focused professional development program measured against the professionals' workplace reality and development needs.

2. *Methodological-didactical and medial conception (Instructional Design)*

   This topic area covers basic principles of professional learning and educational psychology, principles and formats of individualised and personalised learning and the design of tailor-made learning offers as well as the use and implementation of digital tools in professional teaching and learning processes (aimed at achieving competence- and implementation-oriented learning outcomes).

3. *Examination of the learning progress and outcomes*

   This topic area deals with methods and formats to assess the learning success or progress of individual learners, depending on the competence-oriented learning objectives. The contents of this topic area take into account the respective target group of the developed program/curriculum and the corresponding necessity and, if applicable, standardization of respective examinations.

Application task accompanying the online learning element

In accordance with the methodological framework described in the beginning, the application task offers the possibility to transfer the newly acquired knowledge step-by-step to the respective professional scenario that is relevant for the learners.

Participants have to write a proposal for a potential upskilling program for professional engineers in their field of expertise. The topic can be chosen freely; participants may also use an existing course that they teach to university students as a starting point and work on adapting this to the target group of professionals.

A concept paper constitutes the result of the application task accompanying the online learning element. The concept paper (3-4 pages) should include

- a description of the target group for the upskilling program (background, professional experience, skills, expected needs and prerequisites)
- the topic of the upskilling program and an outline of the content (no detailed description necessary)
- a list of the competence-oriented learning goals for the upskilling program
- an outline of the learning format of the upskilling program (online vs. on-site vs. hybrid), including reasoning for the decided format

2.4. Training program element II: On-site Bootcamp

The on-site Bootcamp element of the training program will be hosted by TUM and invites participants from all partner universities. The Bootcamp will follow the general structure of the methodological framework described in section 2.2. (see Figure 1) but will implement it in a more flexible way to best possibly use the benefits of the synchronous in-person learning experience (i.e. particularly the formats of the thematic overview, learning content and clarification tasks will be adapted to the on-site setting).

Main learning objectives of the on-site Bootcamp

- Being able to develop audience-centred content with successful story-telling and professional appearance
- Understanding of how to break down and visualize complex topics and apply them using practical examples
- Understanding how to make research results usable and being able to communicate the relevance, relativity and uncertainty of science
- Understanding the importance of interdisciplinary exchange and being able to promote joint work

Learning content and topic areas in focus at the on-site Bootcamp

The on-site Bootcamp will focus on the social-communicational competences that have been identified as central for the role of the Expert for L&PD in the Qualification Framework (D2.2). These mostly concern audience-tailored communication of scientific topics (including the skills to break down and visualize complex topics and apply them using practical examples) and (interdisciplinary) cooperation when developing professional education offers. These contents are summarized in three central topic areas that were identified for the on-site Bootcamp:

1. Science communication and public impact
2. Data science and visualization
3. Science transfer and product development

The Bootcamp will work with keynote speakers that share best-practice examples and present theoretical input. Based on these inputs, the Bootcamp focuses on the relevance and reflection of the own role of participants as "Learning Professionals" with a series of workshops, practical exercises and time to work on application task (in groups), including presentations of and feedback on results from workshops and exercises.

Application task accompanying the on-site Bootcamp

Based on their concept paper of a potential upskilling program for professional engineers (i.e. results of the application task accompanying the online learning element), participants have to select one central topic of the proposed course (suggested: the introductory session) and elaborate it further.

For the application task accompanying the on-site Bootcamp, participants should

- identify potential challenges in communicating the chosen content to the target group of the training program and write a comprehensive description of the content (optional: add visualizations to the description if there they see fit)
- pick an aspect of the topic that they expect to be rather complex and outline their suggested approach to make it more accessible
- reflect on the use and impact of the training content for the target group and describe the own role and strategy for maximising it

It is strongly suggested that participants complete the online learning element before taking part in the Bootcamp. However, it is possible to only join the Bootcamp, particularly if participants already have a concept paper of a potential upskilling program for professional engineers from their daily work and would like to focus on training their social-communicational competences. Notably, the Bootcamp does not review the concept papers for potential upskilling programs; hence, when only completing this part of the training program the quality of the upskilling program concept (in line with principles of competence- and implementation-oriented learner-centred competence development) will not be covered.

3. CONCEPT FOR ATTRACTING POTENTIAL PARTICIPANTS

Potential participants of the training program will be attracted via various channels.

First, using the ***existing contacts and network within BoostEuroTeQ and EuroTeQ***, the following groups of people will be contacted again to inform them about the training program and invite them to participate and/or forward the invite to their colleagues:
- Contacts at the teaching & learning units of all partner universities that have been interviewed for Deliverables D2.1 und D2.2
- Participants of the "(Boost)EuroTeQ meets Lifelong Learning" Info Session hosted in Nov 2022 where the Qualification Framework for the "EuroTeQ Learning Professional" was presented and first ideas for the training concept were shared
- Members of the EuroTeQ WP 4 Professional, specifically participants of the Joint Meetings on Lifelong Learning in EuroTeQ (in March and June 2023) where the Qualification Framework for the "EuroTeQ Learning Professional" and ideas for the training concept were presented
- Participants of the workshops with teaching & learning units offered by BoostEuroTeQ WP 6 (focusing on co-creation teaching)
- The EuroTeQ Heads of Lifelong Learning (i.e. the heads of the Lifelong Learning units at all EuroTeQ partner universities; a working group initiated by EuroTeQ WP 4 Professional)

These groups are particularly suitable to attract potential participants or to participate in the training program themselves; they have been involved in the development of the training concept at various stages and have already shown interest. Moreover, members of all partner universities are represented in these groups so that the call for participants can be well distributed.

Second, using ***local networks and channels at the partner universities***, there will be efforts to reach potential participants beyond the existing network of Boost and EuroTeQ described above.
- The members of Work Package 2 (specifically DTU and L'X, supported by the other partners) will implement „outreach activities" at their universities using the local channels to attract participants. For instance, at TUM there are several mailing lists to reach academics (via schools and institutes, via university-wide centres such as the graduate centre, etc.).
- The existing contacts in the field of professional education (i.e. academic program directors and staff in existing programs offered by the TUM Institute for LifeLong Learning) and participants of related internal training programs at the partner universities (e.g. offered by the teaching & learning unit) are potential participants that will be informed about the training program and invited to participate and/or to forward the invite to their colleagues.

Similar structures exist at all partner universities, so that all project members can take respective actions.

Third, **_further dissemination activities_** will be implemented to promote the training program at the EuroTeQ partner universities (beyond the reach of the aforementioned existing networks and contacts). Therefore, the existing video which was produced by WP 2 to explain the role of the "Learning Professional" (i.e. "Expert for L&PD") will be used (see here). In collaboration with the BoostEuroTeQ Work Packages 7 and 8 focusing on outreach and dissemination activities, additional content will be created and the established communication channels of the BoostEuroTeQ project (e.g. news articles on the website, posts on LinkedIn, etc.) will be used to inform about the training program and to attract potential participants.

4. EVALUATION CRITERIA

The evaluation and thus statements on the success of the training program will be made using project-specific indicators. The indicators address the entire spectrum of the training program and refer to content-related, didactic, methodological-medial and pedagogical as well as administrative aspects. The central indicators derived from the success criteria of the training program for the "EuroTeQ Learning Professional" are listed in the table below.

Objective	Dimension	Indicators
Participants have completed the training program.	quantitative	Participants from different partner universities enrol in the training program
	quantitative	Enrolled participants complete the training
Participants have higher competences that qualify them as "Experts for Learning & Professional Development".	quantitative	Participants successfully complete the project tasks (multiple-choice tasks in the learning platform and application task)
	quantitative / qualitative	Self-assessment of participants
Participants are able to transfer the content of the training program into their workplace setting.	qualitative	Participants identify and reflect application contexts (together with peers)
	quantitative	Participants successfully complete the application task
The structure and format of the training concept are suitable for the target group and training purpose.	quantitative / qualitative	Participants recommend continuation and participation of colleagues
	quantitative / qualitative	Participants feedback compatibility of work and training program
	quantitative / qualitative	Participants feedback a fit to needs, expertise and prior knowledge
The training program is suitable for scaling at the EuroTeQ universities.	qualitative	Interest of participants / partner universities identified through pilot run

Notably, this list of evaluation criteria is not exhaustive and additional indicators may be added in the course of evaluating the pilot activities (see Chapter 5).

5. OUTLOOK: PILOT ACTIVITIES IN BOOSTEUROTEQ

Based on the concept for the training program presented in this Deliverable, the next step in Work Package 2 will be so-called "pilot activities" to activate potential Learning Professionals (i.e. "Experts for L&PD") at the partner universities (Deliverable D2.4).

The training concept was developed in a way that aims to facilitate the execution of these pilot activities in an effective manner. The training concept focuses on the most central competences that Experts for L&PD require (cf. Qualification Framework, D2.2). Moreover, the training concept is developed in a modular structure with different elements that are related but can – if needed – be completed standing on their own so that potential Experts for L&PD at the partner institutions can participate in the training activities in the most suitable way for them. For the best learning effect it is, however, strongly recommended to attend to all modules offered.

With regard to the planned pilot activities, specific elements of the developed training program for the "EuroTeQ Learning Professional" program as described in this Deliverable will be implemented and piloted during the remaining duration of the BoostEuroTeQ project (i.e. until WP 2 is completed in April 2024). In a first step, the pilot activities will focus on the training program element I (the online learning environment), where first activities are planned for fall 2023. The pilot activities will allow for an evaluation that provides valuable lessons learned regarding (a) the selected content of the training program as well as (b) the structure and format of the training program. The results of the evaluation can then be used to identify the best strategy to improve and scale-up the training program at the partner institutions.