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WP 7 – Network Management and Exchange

D7.6 Record of staff exchange

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About TeachHy

As the FCHT industry gradually emerges into the markets, the need for trained staff becomes more pressing. TeachHy2020, or short TeachHy, specifically addresses the supply of undergraduate and graduate education (BEng/BSc, MEng/MSc, PhD etc.) in fuel cell and hydrogen technologies (FCHT) across Europe.

TeachHy2020 will take a lead in building a repository of university grade educational material, and design and run an MSc course in FCHT, accessible to students from all parts of Europe. To achieve this, the project has assembled a core group of highly experienced institutions working with a network of associate partners (universities, vocational training bodies, industry, and networks). TeachHy offers these partners access to its educational material and the use of the MSc course modules available on the TeachHy site. Any university being able to offer 20 to 30% of the course content locally, can draw on the other 80 to 70% to be supplied by the project (and its successor entity that will support the platform post-project).

This will allow any institution to participate in this European initiative with a minimised local investment. TeachHy will be developing solutions to accreditation and quality control of courses, and support student and industry staff mobility by giving access to placements. Schemes of Continuous Professional Development (CPD) will be integrated into the project activities. We expect a considerable leverage effect which will specifically enable countries with a notable lack of expertise, not only in Eastern Europe, to quickly be able to form a national body of experts.

TeachHy will offer some educational material for the general public (e.g. MOOC's), build a business model to continue operations post-project, and as such act as a single-stop shop and representative for all matters of European university and vocational training in FCHT. The project partnership covers the prevalent languages and educational systems in Europe. The associated network has over 70 partners, including two IPHE countries, and a strong link to IPHE activities in education.

Deliverable Abstract

A staff exchange programme was to be setup and used to facilitate the movement of staff across the core and associate network to promote knowledge transfer and professional development. All exchanges to be logged and recorded in deliverable D7.6.

Due to the advent of Covid, movement of staff and students terminated and did hardly resume in 2022. Therefore the extent of staff exchange was rather limited.

1 Exchange Management

During the first period of the project (2017-2019), the management of the project network was based on meetings at the different universities that were members of the project. During these project meetings, staff members were able to visit the installations of the other consortium members and discuss the content of the different modules that had to be developed. The list of the project meetings was as follows:

- Delft 18/01/2017
- Birmingham 15/03/2017
- Copenhagen 04/05/2018
- Prague 15/06/2018
- Birmingham 25/09/2018
- Brussels 13/11/2018
- Grenoble 24/01/2019

Moreover, during this period, the chair of the Hydrogen Europe Research organisation, Mr. Laurent Antoni, visited the installations of the University of Birmingham and discussed the content of the TeachHy programme.

In 2020, the COVID-19 pandemic started. This pandemic prohibited to exchange staff members between the different institutions, all the project meetings moved to being organised remotely (Zoom meetings). Inside the different institutions, the courses, lectures, and even the laboratory trainings were organised on-line. This emphasised the need to have recorded lectures and remote laboratories but imposed an absence of direct contact between the project staff and lecturers at the project partners, as well as between teachers and learners.

Nevertheless, two examples of on-line meetings where TeachHy members were involved and interacted with other project partners and a variety of other participants are listed below:

- Aalto University, EPFL and Technion (Israel) organised the PhD Innovation Excellence in Clean Energy Transportation with the help of the EIT Urban Mobility. In this frame, a 3 days PhD online course on urban mobility (1 Credit) was organised by EPFL from 10 to 12 November 2020 with the contribution of TeachHy partners (Profs Massimo Santarelli and Robert Steinberger-Wilckens). 100 students from 22 countries participated in the courses.
- In August 2021, the University of Udine (Italy – member of the associated network) and the CISM centre in Udine organised of a Summer School course in renewable energies, energy storage and hydrogen economy with the participation of a number of TeachHy members (Profs Massimo Santarelli, Robert Steinberger-Wilckens, and Vladimir Molkov).

When the constraints on travels between European countries weakened in 2021/22, the practice to organise on-line courses, meetings, and scientific conferences continued. It was decided among the TeachHy partners to keep on-line meetings for the rest of the project duration and consequently to cancel staff exchanges.

2 Working with other projects

As work in on the teaching programme progressed, a number of interactions with other projects evolved. Specifically through the JESS Summer School in 2021/22 and the EIT-KIC innoenergy funded project KICStartH2 from 2022, connections to developed which involved close staff interaction and benefited the completion of the module catalogue for the evolving MSc programme implementation at UBHAM.

From as far back as 2019, UBHAM has been developing a strategic alliance with the Bundesanstalt für Materialforschung (BAM) in Berlin. One of the areas of common interest was identified to be hydrogen, with the consequence that BAM was increasingly involved in the JESS module on Hydrogen Safety.

The Joint European Summer School on Fuel Cell, Electrolyser, and Battery Technologies was built in 2010 to 2012 on the foundations of previous SOFC Summer Schools in the projects Real-SOFC and LargeSOFC. JESS was developed into an all-encompassing initiation School for PhD students working in the wider field of fuel cells and/or hydrogen and/or batteries (i.e. electrochemistry), in order to give them a broad overview of the technologies they were getting involved in. This originated from the perception that PhD students often were very much focused on their specific topic, without during their studies gaining much insight into what their work was embedded in. JESS therefore offers a welcome and increasingly popular (over 130 students enrolled in 2022) opportunity to engage with experts from the field of FCH technologies (and batteries), as well as with peers from other universities and countries. Since 2012, JESS has been operating as a private initiative between UBHAM, Forschungszentrum Jülich, and DTU, with support from Ulster University.

In the first week of the annual September event in Greece (currently in the vicinity of Athens), three basic introductory modules are offered that carry 3 ECTS credits each. They cover low and high temperature fuel cell/electrolyser technology, and batteries. In the second week JESS offers a module in Hydrogen Safety, one in Fuel Cell electric Vehicles (FCEV), and one in Innovation Management and Business Development.

The FCEV module involves researchers from University of Chemnitz, the former Director of Research of Daimler (now emeritus from University of Esslingen), and staff of Toyota Europe. It has evolved into the same material als used in the TeachHy curriculum, using recordings of the lectures given at JESS and re-recorded sessions. Interaction with Thomas von Unwerth (Chemnitz), Ferdinand Panik (Esslingen) and Jiri Hrdlicka (now AFCEnergy) has been intense and resulted in a high-quality module. In lack of travelling opportunities the coming-together at the JESS events (which have brazenly taken place in person every year – taking every care not to spread infections)

has served as a platform for working together, comment on each others' lectures and in general broadening our horizons as we attended lectures ourselves.

As Ulster University could not participate in JESS 2021, BAM was brought in to supply relevant lectures. In 2022 a hybrid module was created, using both UU and BAM contributions. Again, lecturers had the opportunity to interact, learn from each other and plan next steps. This version has now been turned into one of the core modules in the TeachHy MSc, proving the usefulness of JESS for staff interaction, as well as the advantages of having a diverse group of lecturers produce and deliver a module.

Finally, the Innovation Management and Business Development module as been part of JESS since 2014. IMBD has been integrated into the KICStartH2 project to be converted into a blended learning module, potentially set up o the UBHAM CANVAS LMS. Th eteaching material was considerably expanded together with Université Catholique de Louvain la Neuve (KICStartH2 partner). In this guise it could be registered for UBHAM use and become an official, optional module in the TeachHy programme Currently the module lead, Dr Birgit Thoben of Swiss Future.Solutions GmbH, is working with the UBHAM career network to explore ways of working together on a continuous basis.

3 Conclusion and Summary

As such, the TeachHy project did not excel in a managed staff exchange programme – mainly due to Covid restrictions cutting in at the point when exchanges would have started to make sense and be helpful, e.g. in setting up modules on LMS platforms.

Nevertheless, a large number of staff interactions has taken place, in slightly different contexts, that have led to improved quality of TeachHy modules and a general learning process with lecturers, especially those with little university experience.