



Grant agreement number: 779730

WP 5 – Integration onto online e-learning platform

D5.2 Conduct a preliminary trial run of the LMS

Due date: 31/12/2020

Lead participant name: Grenoble INP

List of contributors: UoB

Status: F (Final)

Dissemination level: CO (Confidential)

Last updated: 30/04/2021
(revision 23/10/2023)



Document History

Issue Date	Version	Changes Made/Comments
30/04/2021	1.0	draft
23/10/2023	2.0	editing for publication

Copyright:

This Document has been created within the H2020 project TeachHy2020. The utilisation and release of this document is subject to the conditions of the contract within the **Fuel Cells and Hydrogen 2 Joint Undertaking**.

Disclaimer and Acknowledgment:

This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking under grant agreement No 779730. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme, Hydrogen Europe and Hydrogen Europe research.

Any opinions expressed in this report are solely those of the authors and neither of the FCH 2 JU, nor the European Commission or its representatives.



Table of Contents

About TeachHy	4
Deliverables Abstract	5
1 Original project plan.....	6
2 Modified planning.....	6
3 'Trialling' activities and process	6
4 Collecting feedback	9
5 Summary	9



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.



Deliverables Abstract

This deliverable was originally intended as a report on the first, 'trial' run of the MSc degree programme.

Due to the Covid pandemic impact, this plan had to be modified. The deliverable discusses these developments.

1 Original project plan

Originally, the intention in the project was to collect and develop teaching content (WP 2), and establish the online/blended learning structures on the Learning Management Systems (LMS) of various universities.

Once this was ready, a ‘trial’ course was to be conducted in order to test the material, collect feedback, and then run the second implementation of the programme with more confidence and improved quality.

2 Modified planning

The only university where the first installation of the MSc programme material was viable, was the University of Birmingham (UBHAM), as reported in the progress reports.

Although the online content was more or less ready to be employed in summer 2020, the university administration, under the influence of the Covid pandemic, decided to not start any new activities, and especially not implement new programmes. Therefore, the start of the first run of the TeachHy MSc programme was postponed to the academic year 2021/22.

At this point the accreditation at UCTP in Prague was initiated, as the online material was now complete and could be adequately demonstrated to the academic bodies in Prague.

The originally intended trialling process now coincided with the official start of the programme. An extension was therefore request (and granted) in order to complete a full run of the programme within the project duration. With the extension of two years we actually managed to perform two programme runs within the project duration, starting the third cohort in Sept. 2022.

3 ‘Trialling’ activities and process

As the original intention of running a full trial programme was not allowed to happen, we reverted to a different approach to testing module and lecture content, structure, and delivery.

Most project partners had already from the start begun to use modules intended for the TeachHy MSc programme within their own study programmes. This gave opportunity to ‘test’ modules and adapt/improve their content in a rolling process. Especially Grenoble INP was early in using content and running several trials with French students. University of Birmingham adapted module content previously used in the PhD training. Other universities introduced single modules or even lectures to existing programmes to underpin specialisation qualifications.

Table 1 shows the list of TeachHy curriculum modules with their codes, Table 2 gives an overview of use of TeachHy modules at the partner universities.

Table 1: Overview of TeachHy modules.

Section	No.	Title
Core / Mandatory	C1	Introduction to Electrochemistry
	C2	Fuel Cell Technologies and Applications
	C3	Hydrogen and hydrogen-based fuels
	C4	Fuel cell modelling tools and control
	C5	Characterisation methods
	C6	Fuel Cell and Hydrogen Lab
	C7a	Principles of Hydrogen safety
	C7b	Hydrogen safety
Optional / Elected	O2	Low temperature fuel cells
	O3	High temperature fuel cells
	O4	Fuel Cell systems
	O5	Advanced electrochemical applications
	O8	Fuel cell electric vehicles
	O9	Hydrogen Markets and Policies
	O10	Energy systems and storage

Table 2: Status of TeachHy module use pre-programme roll-out.

Partner	Course	TeachHy modules used	Number of students	Status	Period of delivery
UBHAM	MSc GETS, MSc ACE, 4 th Year ChemEng, MSc FCHT	C2, C3, C5, C7b, O2, O3, O4, O5, O8, O9, O10	5 to 90	ongoing	since 2018
Politecnico di Torino	Polygeneration and Advanced Energy Systems	C3, C4, O2, O3	160 per year	in progress	since 2020
Grenoble-INP	Master EPEE (Electrochemistry and Processes)	C1, C3, C6, parts of O2, NET-Tools e-Laboratory	15 to 45	ongoing	since Oct 2018
TUD	MechEng Master	FC modules	20 to 40	in progress	Oct 2019 (*)
RUG	ChemEng Master	C3	~20	finished	Oct 2020
EPFL	MSc Advanced Energy Conversion	C1, C2, C3, C4, C5, O2, O4, O6, O8	estimated 20?	in progress	since 2018
KPI	MSc Energy	O3, O7	20 to 40	in progress	since 2019
KIT	Hydrogen Technology	Fuel cells	30-60	in progress	since Spring 2020
Univ. Agter (NTU, assoc., and linked to EPFL)	MSc Hydrogen, Fuel Cells, Electrolysis and Batteries	C3, C5	20	in progress	since 2019
Univ. Agter (NTU, assoc., and linked to EPFL)	BSc Fuel Cells and Batteries	C3, C5	60	in progress	since 2019

notes: (*) terminated due to move of lead scientist to RUG

4 Collecting feedback

The experience from running the modules pre-full roll-out of the MSc programme was a positive one, so that no hick-ups were expected from the full roll-out.

Student and lecturer feedback is routinely collected from teaching at most universities. This was collected and used to improve not only the teaching content, but also modes of delivery.

The feedback process was managed in WP 6 and is described in Deliverable 6.2.

5 Summary

The original idea of a 'trial' run of the TeachHy MSc programme was abandoned due to limitations of starting new programmes at UBHAM in the Covid year 2020.

Nevertheless, modules had already and were being used as live and online delivery before 2020 and in the academic year 2020/21. Feedback from this use will be reported within the work from WP 6.