



HyAcademy.EU

WT 2.4 Integration of Soft Skills and Entrepreneurial elements into University Education

Deliverable: D2.1

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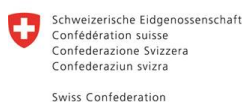
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¹ PU = Public

SEN = Sensitive

PP = Restricted to other programme participants (including the Commission Services).

RE = Restricted to a group specified by the consortium (including the Commission Services).

CO = Confidential, only for members of the consortium (including the Commission Services).

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

Imprint

This document was issued in the name of the project European Hydrogen Academy. You can contact the coordinating institution Vysoká škola chemicko-technologická v Praze (University of Chemical Technology Prague) via the e-mail addresses steinber@vscht.cz or hana.bartkova@vscht.cz. You can also write to the address: H. Bartkova, Vysoká škola chemicko-technologická v Praze, Technická 5, Praha 166 28, Czechia. More information on the project and its results can be found on the project web page www.hyacademy.eu

Project Summary

The European Hydrogen Academy (short: HyAcademy.eu) will capitalise on the investments already made by the European Commission and Member States in education and training activities. The consortium brings together representatives from multiple projects, enabling previous outputs to be consolidated and exploited, maximising the Academy impact and reach.

In order to realise its objectives, the European Hydrogen Academy will have achieved by midterm to - build and sustain a network of over 100 universities (The Network of 100) offering recognised qualifications, specialisations, and degrees in hydrogen technologies,

- build and sustain a network of over 500 schools integrating hydrogen topics into their science teaching, including technical schools and colleges with more specific technical training,
- create a network of 5 hands-on, physical training laboratories,
- offer a portal to showcase and link the educational programmes available in the network and beyond, in order to supply prospective trainees with accurate and detailed information on training and career opportunities, with a minimum of 100.000 accesses to documents specialising in hydrogen topics,
- provide free training materials across European languages to lecturers and teachers in order to enable educational staff to deliver the vast body of educational measures necessary,
- develop and integrate novel (online) teaching methodologies into university, college and school curricula, and train educational staff to successfully employ these, and
- create and implement an organisational structure and a successful business case allowing continuation of the project activities post-funding in establishing a European Hydrogen Academy spanning all levels and types of education and training.

HyAcademy.EU will considerably contribute to the EU goals of offering access to high-quality education, supporting the creation of a highly-skilled workforce and more and better jobs in the European hydrogen industry. Through the school activities it will foster public awareness and acceptance of hydrogen technologies.

The partners of the European Hydrogen Academy are: Vysoká škola chemicko-technologická v Praze (VSCHT or UCTP, coordinator), Rijksuniversiteit Groningen (RUG), Politecnico di Torino (POLITO), Université Libre de Bruxelles (ULB), Universitatea Nationala de Stiinta si Tehnologie Politehnica Bucuresti (NUSTPB), Università Degli Studi Di Modena E Reggio Emilia (UNIMORE), Trakiyski Univesitet (TrU), Université de Technologie de Belfort-Montbéliard (UTBM), Fundacion Para El Desarrollo De Las Nuevas Tecnologias Del Hidrogeno En Aragon (FHa), DVGW Deutscher Verein des Gas- und Wasserfaches Technischwissenschaftlicher Verein e.V., KIC innoenergy SE, EUREC, Technokrati Ltd., Future.Solutions Sarl, University of Ulster (UU), Bertz Associates Ltd., and the University of Birmingham (UoB).

Deliverable Abstract

Task WT2.4 relates to integrating soft skills and entrepreneurial elements into university education, with a focus on hydrogen technologies.

The first step during the first six months of the project was to determine which institutions offer what kind of entrepreneurial education.

To do so, we prepared two different surveys in Microsoft Forms, one referring to Vocational Education and Training (VET) and Continuous Professional Development (CPD), one to university teaching activities. The area explored was education in entrepreneurship or business development in combination with technology or hydrogen.

1. Introduction

The task to be completed in WT2.4 of the European Hydrogen Academy work programme relates to integrating soft skills and entrepreneurial elements into university education, with a focus on hydrogen technologies.

The first step during the first six months of the project was to determine which institutions offer what kind of entrepreneurial education related to hydrogen.

To do so, we prepared two different surveys in Microsoft forms, which are shown in the annexes. One referred to Vocational Education and Training (VET) and Continuous Professional Development (CPD) teaching activities on entrepreneurship combined with technology or hydrogen training, and the other to universities teaching entrepreneurship / business development combined with hydrogen topics.

The trainings we were seeking information on were to clearly focus on the combination of business development and technology, and differ from the classic approach of a more general business school. Some basic elements would overlap, but we emphasized the technical aspects of hydrogen technology integrated into entrepreneurial trainings.

2. Methodology

The training activities we were looking for were to combine business development education with technology, diverging from traditional business school approaches by emphasising technical aspects of hydrogen technology.

We assembled a set of questionnaires in the shape of Microsoft forms. A cover letter was provided with access links to the different surveys, and, for convenience, we also sent an excel sheet that could be used as an alternative if several entries were to be made (instead of filling in the forms multiple times). The letter, detailed in the annex, aimed to introduce the project and increase willingness to participate in the data collection. To improve response rates, the surveys were translated into French and multiple reminders were sent.

We reached out to about 150 contacts. The help of the Interreg NWE Green SKHy project partners was very much appreciated in the process of reaching out to institutions in the NWE region.

Despite these efforts, the overall response rate was low, particularly for surveys combining entrepreneurship with technology.

The forms included detailed questions on various aspects such as course names, language, lecturers, location, education level, target group, participant numbers, theoretical training hours, total hours, duration, examination status, credits, delivery mode (online/in-person/LMS), cost, and availability of handbooks or lab materials.

The following questions were included in the questionnaire forms:

1. University Hydrogen Entrepreneurship survey:

- Institution
- Name of the programme/course
- Name of the lecture (specification required)
- Language of the course (German, French, English,...)
- Lecturer(s)
- Geographical Location
- Education Level (Bachelor, Master, PhD)
- Target Group (UG or PG students or PhD level)
- Number of participants per module/course/programme
- Number of hours of theoretical training
- Number of hours total (incl. student self-learning, tutorials, and exams)
- Duration (weeks, semesters)
- Examined yes/no
- Credits
- Online / in-person / which LMS
- Cost
- Indicate if there is any handbook or lab material (incl. any web links)
- Comments

2. Vocational Education & Training and Continuous Professional Development (VET & CPD) Survey:

- Institution
- Name of the programme/course
- Name of the lecture (specification required)
- Language of the course (German, French, English,...)
- Lecturer(s)
- Geographical Location
- Education Level (Level 3/4/5/6/7, CPD, other)
Level 3 = apprentice, Level 6 = trained technician, Level 7 = MSc equivalent
- Target Group (VET pupils, technicians, graduates etc.)
- Number of participants per module/course/programme
- Number of courses run per year
- Number of hours of practical lab training
- Number of hours total (incl. student self-learning, tutorials, and exams)
- Duration (weeks)
- Examined yes/no
- Micro-Credits
- Cost
- Link
- Indicate if there is any handbook or lab material (incl. any web links)
- Comments

3. Results

We received four replies to the survey related to university teaching of entrepreneurship and business development combined with hydrogen topics.

Three courses are located in Romania, and one will be performed in the Academic Year 2024/25 in Birmingham.

The survey on VET and CPD teaching activities on technology or hydrogen combined with entrepreneurship received no answers to date.

All collected data will be permanently updated, and made accessible on the web page of the European Hydrogen Academy, www.hyacademy.eu. The current status of results is also documented here in the annex.

4. Outlook and next steps

We will connect more personally via the network with institutions with the hope of discovering more about this field. We will also make the need for this important topic more visible via the project web page.

Annexes

Annex 1: Questionnaires

A 1.1 University teaching Entrepreneurship / Business development:

<https://forms.office.com/e/HLDNcjBNd7>

The image shows a Microsoft Forms questionnaire titled "University teaching Entrepreneurship / Business development". The form is displayed on a purple-themed background. At the top, there is a header with the title and a brief description: "This document focuses on collecting Entrepreneurship and Business courses with Technology in it (optional, separately if)". Below the header, there are 20 numbered questions, each with a text input field. The questions are:

1. **Institution** (optional)
2. **Name of the program / course** (specification required)
3. **Name of the lecture** (specification required)
4. **Language of the lecture** (English, German, French, ...) (specification required)
5. **Lecturer(s)** (optional)
6. **Location** (specification required)
7. **Education Level (Bachelor, Master, PhD)** (specification required)
8. **Target Group** (Undergraduate (UG) or Postgraduate (PG) students or PhD level) (optional)
9. **Number of participants per module/course/program?** (Estimate) - (specification required)
10. **Number of modules/ courses/ programmes run per year?** (specification required)
11. **Number of hours of theoretical training** (specification required)
12. **Number of hours total** (incl. student self-learning, tutorials, and exams) (specification required)
13. **Duration** (weeks, semesters) (specification required)
14. **Examined?** yes/no (specification required)
15. **How many Credits?** (specification required)
16. **Cost** (EUR) per Course? (specification required)
17. **Cost** (EUR) per Course? (specification required)
18. **Indicate if there is any handbook or lab material** (incl. any web link) (optional)
19. **Link to the course?** (specification required)
20. **Comments** (optional)

At the bottom of the form, there are navigation buttons: "Back", "Next", "Review", and "Done".

A 1.2 VET and CPD teaching activities Technology or H2 and Entrepreneurship

<https://forms.office.com/e/g8JCxanPX2>

The image shows a Microsoft Forms survey interface. At the top, there is a header with the title 'VET and CPD teaching activities Technology or H2 and Entrepreneurship' and a 'Share as PDF' button. Below the header, the survey consists of 21 numbered questions, each with a text input field. The questions are:

1. Institution (required)
2. Name of the programme / course (specification required)
3. Name of the lecture (specification required)
4. Language of the lecture (English, French, German, ...) (specification required)
5. Lecturer(s) (optional)
6. Location (specification required)
7. Education Level (Level 1-3: VET, Level 4-6: CPD, other Level 7 - 8: Academic level 6 - 8: Master's, Level 9 - 10: PhD) (specification required)
8. Target Group (VET pupils, technicians, graduates etc.) (optional)
9. Number of participants per course (optional) (specification required)
10. Number of courses run per year (specification required)
11. Number of hours of **practical** training (if not relevant, specification required)
12. Number of hours of **theoretical** training (specification required)
13. Number of hours **total** (incl. student self-learning, tutorials, and marking) (specification required)
14. Duration (days, weeks) (specification required)
15. Exemplar? (yes/no) (specification required)
16. Office / Centre (specification required)
17. Online Meeting (Zoom etc.) or platform - **Learning Management System (LMS)** (Moodle, FutureLearn, Blackboard etc.) (specification required)
18. Cost (CPD per learner) (specification required)
19. Indicate if there is any **handbook or lab material** (incl. any web links) (optional)
20. URL to the content? (specification required)
21. Comments (optional)

At the bottom of the form, there are buttons for 'Back', 'Next', 'Cancel', and 'Submit'.

Annex 2: Cover letter

GreenSKHy (InterReg NWE) and The European Hydrogen Academy (Clean Hydrogen Partnership)

Prague, 28 Feb 2024

Dear colleague(s),

we hope this message finds you well.

We have launched the projects Green SHKy (led by AFPA, France) and the European Hydrogen Academy (led by the University of Chemical Technology, Prague) - supported by InterReg NWE and the Clean Hydrogen Partnership - to facilitate collaboration among vocational training services, universities, and schools in Europe (and beyond) that are actively engaged in teaching hydrogen technologies.

We are now reaching out to request your help in improving access to hydrogen education across Europe. Your expertise and insights are critical to the success of our project. We kindly ask for your support by filling out the questionnaires below that are relevant to your activities regarding hydrogen education.

You can either click the short or long link (or copy the https-address into a browser), depending on your account, software and IT settings.

We are asking for details on theoretical or lab-based training, either for university use or in Vocational Education and Training (VET, e.g. Continuous Professional Development courses), and entrepreneurial skills training. Please do not feel overwhelmed and only fill in the sheets relevant to your work:

1. [University - all H₂ teaching activities](https://forms.office.com/e/C8BChB7WKw) or <https://forms.office.com/e/C8BChB7WKw>
2. [University – laboratory H₂ activities](https://forms.office.com/e/29zA8hAWes) or <https://forms.office.com/e/29zA8hAWes>
3. [VET and CPD - all H₂ teaching activities](https://forms.office.com/e/GadbWXUjUv) or <https://forms.office.com/e/GadbWXUjUv>
4. [VET and CPD - H₂ LAB activities](https://forms.office.com/e/Uy9d0wSGR6) or <https://forms.office.com/e/Uy9d0wSGR6>
5. [VET and CPD - teaching activities Entrepreneurship with technology or H₂](https://forms.office.com/e/g8JCxanPX2) or <https://forms.office.com/e/g8JCxanPX2>
6. [University - teaching Entrepreneurship / Business Development with H₂](https://forms.office.com/e/HLDNcjBNd7) or <https://forms.office.com/e/HLDNcjBNd7>

If you prefer to provide your input via an Excel table, please use the attached excel table and send it to us by mail (steinber@vscht.cz).

Your participation is essential in helping us gain comprehensive insights into the current landscape of hydrogen education and practical training activities. Your responses will

contribute to the advancement of hydrogen-related education initiatives and allow interested students to find and contact your institution.

If you are interested in joining the Network100 community of universities the European Hydrogen Academy is building, please additionally provide your contact details using the following links: [Contact Data](#) or <https://forms.office.com/e/76YbXruxw3>

By participating in the Network100, you will benefit from:

- Access to best practices in hydrogen education,
- Exchange and translation of teaching materials,
- Participation in train-the-trainer events,
- Involvement in the development of new teaching approaches,
- Peer-to-peer exchanges on teaching experiences and
- Opportunities for staff and student exchanges.

You can find first preliminary information at www.hyacademy.eu

We appreciate your time and contribution to this important project. Should you have any questions or require further assistance, please do not hesitate to reach out to us.

Looking forward to a fruitful future cooperation,

kind regards from the European Hydrogen Academy leads

Prof Karel Bouzek, and

Prof Robert Steinberger-Wilckens

mail contact: steinber@vscht.cz

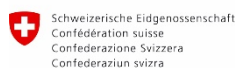
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State Secretariat for Education,
Research and Innovation SERI



UK Research
and Innovation

Annex 3: Data collected

Id	Startzeit	Fertigstellungszeit	E-Mail	Name	Institution (optional)	Name of the programme / course (specification required)	Name of the lecture (specification required)	Language of the lecture (English, German, French, ...) (specification required)	Lecturer(s) (optional)	Location (specification required)	Education Level (Bachelor, Master, PhD) (specification required)
1	6.21.24 9:42:20	6.21.24 10:05:19	anonymous		National University of Science and Technology POLITEHNICA Bucharest	MS9, Faculty of Energy Engineering	Hydrogen and Fuel Cells	Romanian	Ioan IORDACHE	Bucharest, Faculty of Energy Engineering	Master
2	6.21.24 10:05:24	6.21.24 10:13:14	anonymous		National University of Science and Technology POLITEHNICA Bucharest	MS 11	Energy vectors	Romanian	Ioan IORDACHE & Diana COCARTA	Bucharest, Faculty of Energy Engineering	Master
3	6.21.24 10:13:18	6.21.24 11:40:29	anonymous		National University of Science and Technology POLITEHNICA Bucharest	MS 8 (Management of Power Systems)	for the production and use of hydrogen (Soluții tehnico-economice de producere și	Romanian	Cosmin MARCULESCU & Mihaela NORISOR	Bucharest, Faculty of Energy Engineering	Master
4	6.26.24 11:24:10	6.26.24 11:30:19	anonymous		University of Birmingham	FuelCellHydrogen Programm (FCH)	Hydrogen Business Development and Innovation Insights	English	Birgit Thoben	Birmingham	Master

(Undergraduate (UG) or Postgraduate (PG) students or PhD level) (optional)	participants per module/course/programme? (Estimation) -	Number of modules/courses/ programmes run per year? (specification required)	Number of hours of theoretical training (specification required)	Number of hours total (incl. student self-learning, tutorials, and exams) (specification required)	Duration (weeks, semesters) (specification required)	Examined? yes/no (specification required)	How many Credits? (specification required)	Online-Meeting/ in person/ Learn Management System (LMS) - like Moodle, Canvas, Thinkific, ... (specification required).	Cost (EUR) per Course? (specification required)	Indicate if there is any handbook or lab material (incl. any web links) (optional)	Link to the course? (specification required)	Comments (optional)
PG	25	14 courses per semester, 1 semester/year	28 hours / semester	100 hours / semester	14 weeks (1 semester)	Yes	4	Hybrid system (half in person, half on Moodle)	Free	The handbook and lab material are on the Moodle platform of the university, available for the students enrolled to this course	https://curs.upb.ro/2023/enrol/index.php?id=11587	
PG	25	14 courses / semester, 1 semester / year	28 hours per semester	100	14 weeks / semester, 1 semester / year	Yes	4	Hybrid system (half in person, half on Moodle)	Free	The handbook and the lab material are on the Moodle platform	https://curs.upb.ro/2023/enrol/index.php?id=5758	
PG	25	1 course / semester, 1 semester / year	28 hours	100	14 weeks / semester, 1 semester / year	Yes	4	Hybrid system (Half in person, half on Moodle platform)	Free	The handbook and the lab material are available on Moodle platform	https://curs.upb.ro/2023/enrol/index.php?id=5756	
PG or PHD	20	2	28	100	Per semester combined with online training	Yes	10 Credits = 5 ECTS	Online-Meeting, LSM - Canvas	You must be a student in Birmingham	No		Will be introduced End of 2024 - link not existent yet