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TEACHY - A FLAGSHIP PROJECT FOR TEACHING FUEL CELL AND HYDROGEN TECHNOLOGY

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ABSTRACT

The TeachHy project (Teaching Fuel Cell and Hydrogen science and engineering across Europe) is funded by the Fuel Cell & Hydrogen Joint Undertaking (FCH2 JU), as part of the Horizon 2020 Programme. The TeachHy educational material and MSc course modules have been developed for blended learning delivery and will be available through the partnering universities. 12 partners from 11 European countries have contributed to the successful development of 20 modules.

Keywords: TeachHy, hydrogen, Master of Science, blended learning

INTRODUCTION

The TeachHy project is designed as a tool that can be used for universities where they intend to teach a master's programme based on the hydrogen economy, the benefits of implementing hydrogen and fuel cells technology, correlations with other engineering disciplines, etc. The project aims to be a way of increasing the number of postgraduate students in the technical labour market who have the necessary knowledge and skills to implement hydrogen in the field of renewable energy and alternative fuels, providing essential tools to academics in European universities who are active in the field of fuel cell and hydrogen (FCH) technology. The project supports the need for qualified personnel that will grow as the hydrogen industry gradually develops, evolving from a niche concept to a mature market.

Training of personnel to support the emergence and growth of the FCH industry will become a critical component with multi-sectoral implications in ensuring the competitiveness of human and professional resources in the coming decades.

PROJECT DESCRIPTION

The TeachHy project aims to create teaching materials necessary for the training of students pursuing a master's qualification in the field of FCH technology, along with identifying all the steps, difficulties, and solutions necessary to accredit such a master's programme. Obviously, other forms of postgraduate training are included.

The project consortium is comprised of 12 partners from 11 countries (Fig 1): University of Birmingham – UBHAM (UK), University of Groningen (Netherlands), National Technical University of Ukraine 'Kyiv Polytechnic Institute' – KPI (Ukraine), Politecnico di Torino – POLITO (Italy), Karlsruhe Institute of Technology – KIT (Germany), University of Chemistry and Technology, Prague – UCTP (Czech Republic), École Polytechnique Fédérale de Lausanne – EPFL (Switzerland), Grenoble Institute of Technology - Grenoble INP (France), Denmark Technical University – DTU (Denmark), Ulster

University – UU (UK), Université libre de Bruxelles – ULB (Belgium) and University “Politehnica” of Bucharest in partnerships with ICSI Rm. Vâlcea (both from Romania).

The consortium was created around this group of experienced institutions that also collaborate with other relevant partner networks (universities, professional associations, professional groups, etc.). Through this consortium, partners can access educational materials and use the master's course modules available on the project website [1].



Fig. 1. The TeachHy consortium

The above described educational institutions have a strong pedagogical background in the field of FCH technologies, having numerous similar projects, that include educational components, co-financed by the FCH JU, such as HySafe, TrainHy, HyProfessionals, HyFacts, KnowHy, and HyResponse [2].

RESULTS AND DISCUSSION

The TeachHy educational material and MSc course modules have been developed for blended learning delivery and will be available through the partnering universities. 12 partners from 11 European countries have contributed to the successful development of 20 modules. Within the project, the partners have developed seven modules that are mandatory, another eleven that are optional, and two additional ones.

The content of the teaching material includes slides, relevant multimedia materials, diagrams, graphs, figures, or videos, as well as summative evaluations of the modules (tests and exams). Content developers also evaluate and review content produced by other members of the consortium to ensure the delivery of a high-quality and fit-for-purpose educational programme. Where appropriate, the content developers have translated the teaching material into various spoken European languages so that the national language from the respective educational institution can be used.

TeachHy has the ambition to offer interested parties strong support for conducting and accrediting FCH courses. Support will be provided to a large number of European educational institutions, in the academic field, as well as vocational

training institutions. These entities will be able to deliver an FCH master's programme locally, using only 20% of their own resources and the remaining 80% will be the support provided by the TeachHy project. In this way, a significant number of institutions will have the chance to offer high-quality FCH courses across Europe.

Parts of the course content have been delivered and will continue to be delivered to students at partner universities. This is done in order to follow and analyse feedback from students and target groups. The implications of the pandemic required that in addition to the classical approach, virtual pedagogical tools have to be considered in terms of both teaching courses and evaluating students.

CONCLUSIONS

The TeachHy project is an innovative approach that allows the partner institutions (12 universities from 11 European countries) to offer educational courses on FCH technology. This type of pedagogical content is not yet available in many universities. The project partners carry out a series of activities through which they can make available to any educational institution in Europe didactic content that covers FCH technology that meets the highest quality standards.

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