



BR August 15, 2018

CALOHEE final report and follow-up

Context

At its meeting of 31 March 2015, the Administrative Council approved the ENAAE's participation as Partner in the EU project "CALOHEE" (Measuring and Comparing Achievements of Learning Outcomes in Higher Education), proposed by TUNING Europe/University of Groningen and the Educational Testing Service (ETS).

Several subject Areas were considered (Physics, Civil Engineering, Nursing, History and Education Sciences); ENAAE was particularly involved in the Subject Area of Civil Engineering. The ENAAE president was member of the Advisory/Quality Assurance Board of CALOHEE.

With the agreement of ENAAE, Tuning appointed Alfredo Squarzoni and Alfredo Soeiro coordinators of the Civil Engineering group. Among its members, ENAAE called for HEI's willing to contribute to the works of the Civil Engineering group.

CALOHEE outputs for ENAAE and possible follow-up

The project ended in the spring of 2018, the summary report for Civil Engineering is attached to this document. The more detailed report "Tuning-CALOHEE Assessment Frameworks for the Subject Area of Civil Engineering" is given in a separate appendix.

The Tuning-CALOHEE Assessment Frameworks (TCAF) are largely based on the EUR-ACE Programme Outcomes (PO) but provide in the same time important precisions and insights, which will be useful for the future evolution of the EUR-ACE Standards and Guidelines.

The main features of TCAF are:

- The TCAF "dimensions" take up the EUR-ACE learning areas (Knowledge and Understanding, Analysis, Design, Investigation, ...), with the 2 levels (Bachelor and Master), but split "Communication and Team working" in 2 separate dimensions.
- TCAF dissociate the different aspects of the learning and teaching process in terms of "Knowledge", "Skills" and "Wider competences (Responsibility and Autonomy)", in better coherence (than the EAFSG) with the European Qualifications Framework (level 6 and 7)
- TCAF provide a specific framework for Civic, social and cultural engagement.
- Each Dimension/Learning Area has descriptors for the Knowledge/Skills/Competences:

- at a generic level which may apply to all engineering domains;
- specialized to the Civil Engineering domain.
- TCAF list the Assessment, Learning and Teaching approaches usable to achieve the described outcomes.

The (draft) report “Guidelines and Reference Points for the Design and Delivery of Degree Programmes in Civil Engineering” brings more detailed information, including a comprehensive study of the “Correlation of EUR-ACE Learning Areas” with the LOs of other Frameworks, respectively: Tuning-AHELO, EUCET (European Civil Engineering Education and Training) , IEA-Washington Accord, ABET, CDIO, National Society of Professional Engineers and the American Society of Civil Engineers.

Recommendations

- To congratulate and thank Alfredo Squarzone and Alfredo Soeiro for the excellent work done with the CALOHEE project team;
- To note that the Tuning-CALOHEE Assessment Frameworks (TCAF) will provide a consistent input to the next revision of the EUR-ACE EAFSG;
- To study the interest and the possibility of extending the EAFSG with specialized sections dedicated to the different domains of engineering.

Guidelines and Reference Points for the Design and Delivery of Degree Programmes in Civil Engineering

Summary

This is the first document in Civil Engineering that is published in the framework of a series of *Tuning Reference Points* for subject areas which started in 2008. It builds on documents published in the past, in particular the publication *A Tuning-AHELO Conceptual Framework of Expected Desired/Learning Outcomes in Engineering*, documents of the European Civil Engineering Education and Training (EUCEET) Association and the *EUR-ACE Framework Standards and Guidelines* (EAFSG).

The document addresses degree profiles, tasks and societal roles graduates will perform in Civil Engineering. It tries to address how the programs try to fit into the wider context of overarching qualifications frameworks like the National and European Qualification Frameworks. These guidelines present general descriptors for the first and the second cycle (bachelor and master levels). There are easy-to-read tables suggested to be used as reference points for the design and delivery of individual degree programmes. According to the Tuning philosophy, each degree programme has its own unique profile, based on the mission of the institution and taking into account its social-cultural setting, its student body, and the strengths of its academic staff.

The document is the result of long and intense collaboration by several experts supported by the Tuning Educational Structures in Europe and financed by the CALOHEE project. CALOHEE means Measuring and Comparing Achievements of Learning Outcomes in Higher Education in Europe and is co-financed and strongly supported by the European Commission as part of its Action Programmes for Higher Education. The document is a contribution to the Tuning's mission to offer a platform for debate and reflection to ensure that graduates are well prepared for their societal role, both in terms of employability and as citizens.

The document suggests learning outcomes of civil engineering programmes for first and second cycles of higher education. Learning outcomes are defined in this document as statements of what a learner is expected to know, understand and be able to demonstrate after completion of a learning experience. These learning outcomes are grouped in terms of knowledge, skills and wider competences (attitudes). Some competences are subject-area related (specific to a subject area) and others are generic (relevant for many or all degree programmes).

The document was produced after a thorough analysis of the Civil Engineering sector and occupations and tasks performed by graduates, a global study of typical degree programmes and of main sub-fields or specializations. That was followed by a methodical verification of existing Civil Engineering qualification systems and quality assurance procedures like ENAEE, ABET, ASCE and CDIO. A framework was then produced with the synthesis of existing lists of required competences. Associated with the list of learning outcomes expected for civil engineering programmes the group involved researched teaching methods, learning approaches and assessment techniques that were proposed for each learning outcome. The teaching methods and learning approaches were proposed based on surveys, desk research and group members' contributions. The assessment techniques

were obtained using an existing model (TALOE) to align these with the different types of learning outcomes.

The result presented in this document is complemented by the Assessment Framework where conclusions are structured. This document is a powerful suggestion to allow comparison and benchmarking of Civil Engineering programmes fostering quality improvement and better qualified graduates.