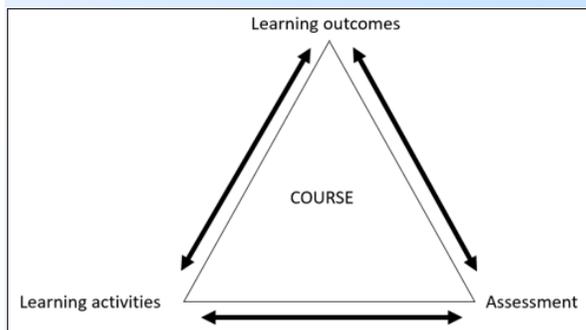


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Technological Pedagogical Content Knowledge (TPACK) describes what knowledge lecturers need for teaching. TPACK describes how the areas of knowledge interact with each other and influence one another in unique and specific contexts. Explanation of TPACK in 3 minutes: <https://youtu.be/0wGpSaTzW58>



**Constructive alignment** (Biggs, 2011) describes the alignment of intended learning outcomes, learning activities and assessment. The alignment supports learners in effective learning to become critical thinkers.

## Three dimensions of STEM-CPD

### STEM-teaching Competences

*examples*

- develop critical thinking
- engage students, arouse interest for the discipline
- give prompt feedback
- frame the course in the context of study / programme

### Teaching Attitudes

*examples*

- inspire a positive attitude in their class.
- be reflective teachers
- use students' evaluations / feedback to improve courses.
- be interested in their students' progress.

### Type of CPD Activities

*examples*

- attending or giving presentations, work-shops, webinars, conferences, summer schools about teaching and learning in HE, organized specifically for STEM lecturers and more general
- following online courses / MOOC about teaching and learning
- getting peer-feedback on own teaching practice from a colleague
- getting or giving mentoring

## FRAMEWORK FOR STEM-CPD

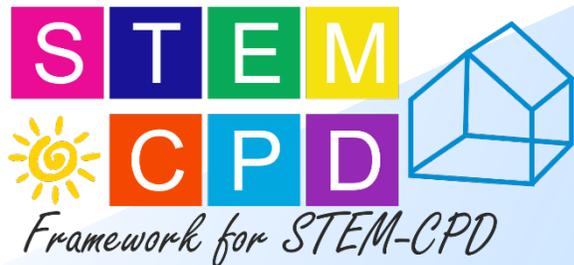
A sustainable continuous professional development (CPD) framework for Science, Technology, Engineering and Mathematics (STEM) educators is based on the Technological, Pedagogical, Content Knowledge model (TPACK), the principles of train-the-trainer approach and co-creation.

This framework was developed in the STEM-CPD@EUni project. The framework has five elements.



<https://ectn.eu/work-groups/stem-cpd/>

*Disclaimer:* The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



# 1



## CPD-Ambassador

is involved in higher education and promotes awareness of university STEM teaching competence, defines CPD needs of teaching staff, organizes professional development activities, and promotes CPD as a requirement for a sustainable quality of higher education teaching and learning.

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<https://unsplash.com>

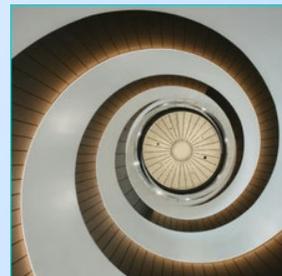
# 2



## User Case

is a description of a CPD solution for a local teaching and learning challenge, a list of CPD goals, activities and materials, expected impact of the CPD solution on the quality of local educational practice, reflection / evaluation of the experiences, and a plan for possible follow-up.

# 3



## Scenario

clusters different user cases related to the teaching competences and attitudes developed in the user case and the CPD activities used in learning environments.

# 4



## Summer School

is a week-long event with the aim of professionalizing CPD Ambassadors in the three dimensions: teaching competences, attitudes and using different types of CPD activities. The final content of each summer school is determined by the needs of the participants.

# 5



## STEM-CPD Community

is the community of CPD-Ambassadors. It encourages members to continue to share knowledge and experiences and to support each other in their continuous professional development. It gives input to the Summer Schools.