

Aspects of STEM teacher competences that are explicitly and implicitly required in Greece, the Netherlands, Bulgaria and Spain

Provided here-below is an overview of Science, Technology, Engineering and Mathematic (STEM) teachers' competences that are required in the national contexts of Greece, the Netherlands, Bulgaria and Spain. Considered are three dimensions of competences (knowledge & understanding, skills, dispositions & attitudes), while aspects in each dimension have been adopted by EC (2013) teacher competences' framework (1). Aspects *explicitly* evident refer to evidence as demonstrated in the national policy documents and the curricula for STEM teachers' training; aspects *implicitly* evident refer to evidence as demonstrated in students' STEM curricula.



Aspects of **knowledge & understanding** required in the national contexts of:

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	Greece		Netherlands		Bulgaria		Spain	
	Explicitly	Implicitly	Explicitly	Implicitly	Explicitly	Implicitly	Explicitly	Implicitly
Subject matter knowledge		✓	✓		✓		✓	
Pedagogical content knowledge		✓	✓		✓			✓
Pedagogical knowledge	✓	✓	✓		✓		✓	
Curricular knowledge	✓		✓		✓		✓	
Educational science foundations	✓		✓		✓		✓	
Contextual, institutional, organizational aspects of educational policies	✓		✓		✓		✓	
Issues of inclusion and diversity	✓	✓	✓	✓	✓		✓	✓
Effective use of technologies in learning	✓	✓	✓	✓	✓	✓	✓	✓
Developmental psychology	✓	✓	✓		✓		✓	✓
Group processes and dynamics, learning theories, motivational issues	✓	✓	✓	✓	✓		✓	
Evaluation and assessment		✓	✓		✓		✓	



Aspects of **skills** required
in the national contexts of:

	Greece		Netherlands		Bulgaria		Spain	
	Explicitly	Implicitly	Explicitly	Implicitly	Explicitly	Implicitly	Explicitly	Implicitly
	Planning, managing and coordinating teaching	✓	✓	✓	✓	✓	✓	✓
Using teaching materials and technologies	✓	✓	✓	✓	✓	✓	✓	
Managing students and groups		✓	✓	✓	✓	✓	✓	
Monitoring adapting and assessing teaching/learning objectives and processes	✓		✓	✓	✓		✓	
Collecting, analyzing, interpreting evidence and data for professional decisions		✓	✓	✓	✓			✓
Using, developing and creating research knowledge to inform practices	✓		✓	✓	✓		✓	✓
Collaborating with colleagues, parents and social services			✓		✓			
Negotiation skills (social and political interactions with multiple educational stakeholders, actors and contexts)								
Reflective, metacognitive, interpersonal skills for learning individually and in professional communities	✓			✓	✓		✓	
Adapting to educational contexts				✓	✓		✓	



Aspects of **dispositions & attitudes** required
in the national contexts of:

	Greece		Netherlands		Bulgaria		Spain	
	Explicitly	Implicitly	Explicitly	Implicitly	Explicitly	Implicitly	Explicitly	Implicitly
Epistemological awareness	✓				✓	✓	✓	
Teaching skills through content		✓	✓		✓		✓	
Transferable skills				✓	✓			
Dispositions to change, flexibility, ongoing learning and professional improvement, including study and research	✓			✓	✓		✓	
Commitment to promoting the learning of all students	✓	✓	✓		✓		✓	
Dispositions to promote students democratic attitudes and practices as European citizens	✓	✓	✓	✓	✓			✓
Critical attitudes to one's own teaching	✓		✓	✓	✓		✓	
Dispositions to team working, collaboration and networking	✓		✓	✓	✓			✓
Sense of self-efficacy								

How did we arrive at these outcomes? First, the national contexts of Greece, the Netherlands, Bulgaria and Spain in terms of STEM teachers' competence development were explored via documentary analysis of policy documents, STEM teachers training curricula and students' STEM curricula in each country - see the report "*Policy envisions and requirements for STEM teachers' competence development: the case of Greece, Netherlands, Bulgaria and Spain*", accessible here: <http://www.learning-in-teaching.eu/images/docs/EN/IO1/IO1.pdf>. The information provided in the report was then mapped into EC (2013) framework for teachers' competence development (1), providing comparative insights on the dimensions and aspects of competences (knowledge & understanding, skills, dispositions and attitudes) that are explicitly (at policy & policy mediation level) and implicitly (at teaching practice level) evident.

(1) European Commission (2013) Supporting teacher competence development for better learning outcomes http://ec.europa.eu/dgs/education_culture/repository/education/policy/school/doc/teachercomp_en.pdf