

ELITE_e

Enhancing Learning In Teaching via e-inquiries

learning-in-teaching.eu

This project has been funded with support from the European Commission. This publication (communication) reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Co-funded by the
Erasmus+ Programme
of the European Union



WHAT IS ELITE?

ELITE is concerned with supporting (STEM) teachers' **development of knowledge, skills and attitudes** so that they can effectively address their roles as **facilitators of students' learning, lifelong learners, and members of educational communities.**

The project adopts the **inquiry-based learning (IBL) methodology** in professional learning activities as a means to facilitate (STEM) teachers' inquiry and reflective practice.

THE PROJECT'S BACKGROUND

Perspectives		Challenges	Implicit requirements
	Contextual	Variation in terms of teacher competence requirements among and within EU countries	Place-based approach, taking into consideration national policy requirements and practice needs
	Methodological	Teachers' practice is influenced by the way they have received training themselves	Modernisation of teacher training methodology
	Content-related	Thematic that facilitates addressing STEM broader aims	Relevance of the thematic to STEM broader educational aims
	Outcome-related	Need for more rigorous evidence of the impact of competence based frameworks on teachers' professional learning	Need for evidence-based framework for STEM teachers' competence development

MAIN ELEMENTS OF THE APPROACH

- » Adopts a **place-based approach** for (STEM) teachers' professional learning, taking into consideration **national policy requirements** and **practice needs**;
- » Fosters the adoption of the **inquiry-based learning (IBL) methodology** in professional learning activities, under the assumption that (STEM) teachers' training via IBL methodology supports the **development of teacher competences**;
- » As thematic for (STEM) teachers' professional learning, it promotes **content areas** that reflect current **policy orientation** on the broader aims of STEM education, so as to facilitate teachers to shape key competences required (knowledge, skills and attitudes) in order to help **students** in acquiring them;
- » Is oriented towards **facilitating the development** of an evidence-based framework for teacher's competence development through IBL methodology.

COMPARATIVE OVERVIEW

The table below outlines the teachers' competences from analyses conducted in **Greece**, **The Netherlands**, **Bulgaria**, and **Spain**.

Knowledge and understanding								
	Greece		The Netherlands		Bulgaria		Spain	
	Exp	Imp	Exp	Imp	Exp	Imp	Exp	Imp
Subject matter knowledge		X	X		X		X	
Pedagogical knowledge		X	X		X			X
Curricular knowledge	X	X	X		X		X	
Educational science foundations	X		X		X		X	
Contextual, institutional, organisational aspects of edu. policies	X		X		X		X	
Issues of inclusion and diversity	X	X	X	X	X		X	X
Effective use of technologies in learning	X	X	X	X	X	X	X	X
Developmental psychology	X	X	X		X		X	X
Group processes and dynamics, learning theories, motivational issues	X	X	X	X	X		X	
Evaluation and assessment		X	X		X		X	

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

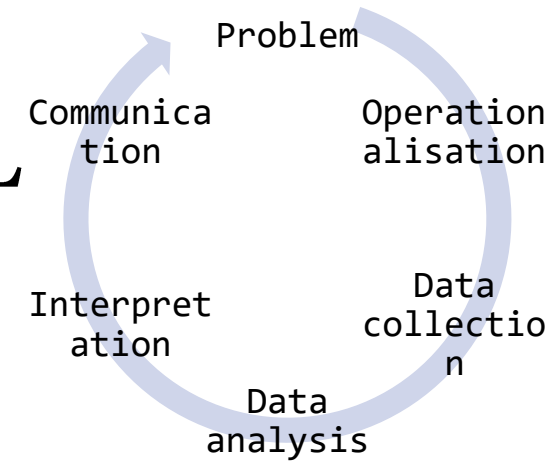
Dispositions and attitudes

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

RATIONALE

E-INQUIRY ENVIRONMENT

E-INQUIRY ENVIRONMENT: Dojo IBL



0. Problem

- Research question
⌚ 3 months ago
- Background informati
⌚ 3 months ago
- What do you already
⌚ 3 months ago
- Concept map
⌚ 3 months ago
- Define concepts
⌚ 3 months ago
- Need to know?
⌚ 3 months ago
- Reflection
⌚ 3 months ago

1. Plan the method

- Measurements
⌚ 3 months ago
- Prediction
⌚ 3 months ago
- Research method
⌚ 3 months ago
- Ethics
⌚ 3 months ago
- Reflection
⌚ 3 months ago

2. Collect the data

- Plan the collection
⌚ a few seconds ago
- Upload the instrumen
⌚ a few seconds ago
- Collect the data
⌚ a few seconds ago
- Evidences
⌚ a few seconds ago
- Reflection
⌚ a few seconds ago

3. Analyse the data

- Process collected da
⌚ a few seconds ago
- Categorised or order
⌚ a few seconds ago
- Processed data
⌚ a few seconds ago
- Visualization of the
⌚ a few seconds ago
- Reflection
⌚ a few seconds ago

4. Interpret the findings

- Remember your predic
⌚ a few seconds ago
- Results confirm your
⌚ a few seconds ago
- Relevant results
⌚ a few seconds ago
- Reflection
⌚ a few seconds ago

5. Communicate the results

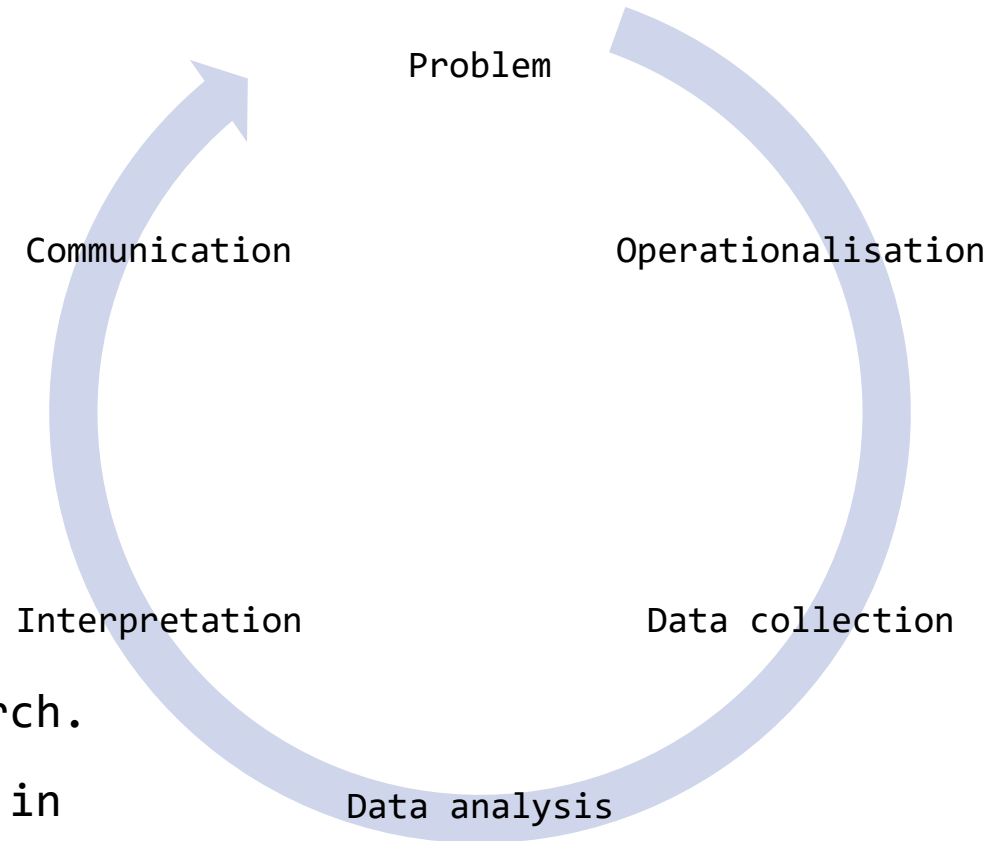
- Personal conclusions
⌚ a few seconds ago
- Group conclusion
⌚ a few seconds ago
- Impact of finding
⌚ a few seconds ago
- Feedback
⌚ a few seconds ago
- Reflection
⌚ a few seconds ago

<https://dojo-ibl.appspot.com>

THE WESPOT IBL MODEL

The weSPOT model moves on from the simplistic **cyclical models steps** required for good research.

The steps are described in scientific literature (Crawford and Stucki, 1990; Hunt and Colander, 2010)



It models inquiry based learning process under 6 phases:

- » Question
- » Plan the method
- » Data collection
- » Data analysis
- » Interpretation
- » Communication

DIGITAL SCENARIOS

- » Dealing with inclusion and diversity
- » Innovative methodologies (IBL and project work, self-directed learning, computational thinking and seamless learning)
- » Opening up school science
- » Formative Assessment
- » ICT enhanced learning and teaching
- » Enhancing teachers-parents collaboration
- » *AND MORE*

THE ELITe HANDBOOK

The **handbook with guidelines** for (STEM) teachers' inquiry and reflective practice provides guidance for teacher educators and teachers upon the ELITe methodology. It includes:

- » **information** about the **IBL approach** and reflective teacher training practices as well as their effectiveness when they are implemented together;
- » a **tool** for evaluating competences and needs in initial teacher training;
- » a set of **thematic areas** for teacher trainings, extracted by the study of national policies in four European countries: Greece, the Netherlands, Bulgaria and Spain;
- » a **model** and corresponding **tools** for designing and implementing competence development teacher trainings, based on IBL and **reflective teachers' practices**;

THE ELITe HANDBOOK

- » a set of **basic teacher training scenarios** in the provided thematic areas;
- » examples of **different interpretations** and adjustment of the **basic scenarios** according to the national contexts and trainings conditions;
- » **best practices** examples for teacher training implementation;
- » a **free online tool** for designing and implementing an ELITe teacher competence development training.

It aims to facilitate development of **knowledge, skills and attitudes** of STEM teachers necessary to tackle requirements/ challenges for STEM practice under their roles as **learners, facilitators of students learning and members of educational communities.**

Nowadays, STEM teachers have to help students not only to acquire knowledge and skills, but also to open their mind as **21st century citizens**, providing:



Ways of thinking - creativity, critical thinking, problem solving, decision-making



Ways of working - communication, collaboration

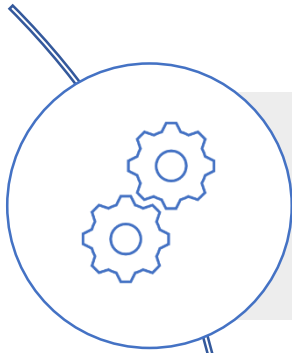


Tools for working - including new technologies



Capacities - related to active citizenship, life, and professional careers

Teachers as lifelong learners need to develop/practice:



Knowledge and understanding on teaching and learning STEM content - STEM knowledge; pedagogical content knowledge; development psychology; inclusion and diversity

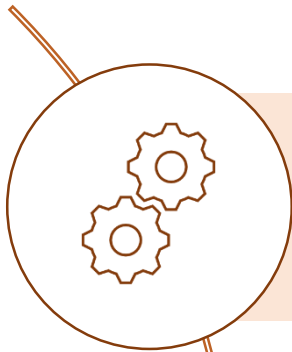


Learning skills - ability to using, developing and creating research knowledge to inform practices; reflective and metacognitive skills for their own learning; interpersonal skills for learning individually and in professional learning communities



Positive dispositions and attitudes towards their own learning - epistemological awareness; positive dispositions to change; flexibility; ongoing learning and professional improvement; critical attitudes to their teaching practices

Teachers as facilitators of students' learning need to develop/ practice:



Knowledge and understanding on methodologies and methods on STEM learning and teaching - pedagogical knowledge; evaluation and assessment; inclusion and diversity

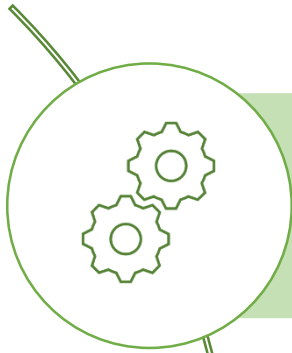


Teaching skills - ability to plan, manage, coordinate teaching; use teaching methods and technologies; monitor, adapt and assess teaching/ learning objectives and processes; collect, analyse and interpret evidence for professional decisions and teaching/ learning improvement; manage students and groups



Positive dispositions and attitudes towards promoting students' learning - commitment to promote learning for all students; dispositions to promote students' democratic attitudes and practices

Teachers as members of educational communities need to develop/ practice:



Knowledge and understanding on contextual aspects of learning and teaching - contextual, institutional, organisational aspects of educational policies; scientific foundations of education



Professional skills - skills to collaborate with colleagues, parents and social services; to negotiate with multiple education stakeholders; ability to adapt to educational contexts; life and career skills



Positive dispositions and attitudes towards promoting students' learning - dispositions to team working; collaboration and networking; sense of self-efficacy

Overview of the ELITE approach for supporting STEM teachers' inquiry and reflective practice in professional learning activities:

Context

A place-based approach to STEM teachers' professional learning, taking into consideration **national policy requirements** and **practice needs**

Promotes the adoption of **inquiry-based learning (IBL) methodology** in professional learning activities

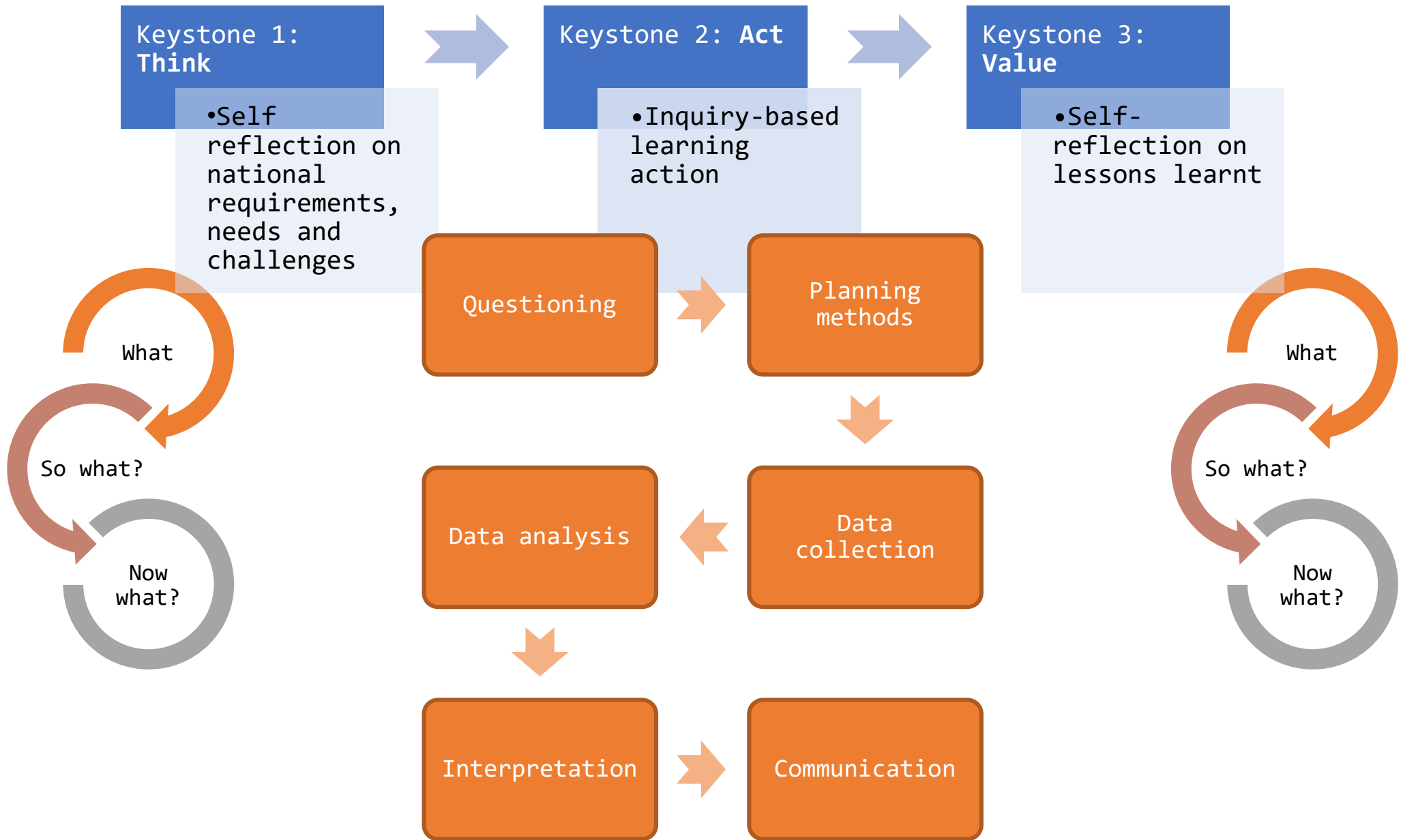
Methodology

Thematic

Proposes content areas that reflect current policy orientation on the broader aims of STEM education as thematic for STEM teachers' professional learning

Oriented towards **facilitating teachers' competence development** through IBL methodology

Outcomes



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