

02

General Introduction of Computational Thinking: a basic module suitable for all teachers

This module aims to provide prospective teachers with a concrete understanding of computational thinking (CT), working knowledge of teaching and learning principles for CT, and to introduce them to computational tools that can support teaching and learning.

For this purpose, the participants are expected to

1. characterise computational thinking in terms of problem-solving steps
2. engage with CT via the use of computational tools; understand how CT can be incorporated in different school subjects via a variety of computational tools
3. engage with CT via programming and practicing algorithmic thinking in the context of storytelling and games
4. learn about instructional and assessment strategies for CT

The module considers CT as a framework to develop cross-curricular skills and competences, suitable for any subject teacher. To this end, the module is organised into the following four units: Unit 1 introduces the concept of CT and compares ways to characterise it in terms of problem-solving activities; Unit 2 introduces CT by utilising different computational tools (Ngrams, NetLogo, Excel) and demonstrates how these tools can be employed to address problems in different disciplines (History, Biology, Geography); Unit 3 focuses on the basics of programming and on practicing algorithmic thinking in the context of storytelling and games with Scratch. The module concludes with Unit 4, which highlights unplugged and plugged teaching and learning activities and discusses essential elements of instructional strategies and assessment for CT.