O8

Educational environments for CT: design and aspects of integration

This module aims to provide prospective teachers the skills to create educational environments that support the integration of Computational thinking (CT) with STEAM. The educational environments provide technologies that scaffold the application of CT to STEAM topics. CT is an important tool in contemporary science, engineering and mathematics. Many modern technologies have computational components. STEAM education merges the liberal arts with STEM (science, technology, engineering and mathematics) to make the ensemble of subjects approachable for a wider student population and to foster creativity.

After completing the module, a successful learner will:

1. recognize opportunities for applying CT in STEAM topics (analysis).
2. be able to choose appropriate educational technology to support CT in STEAM (application).
3. be capable of designing a CT and STEAM based learning intervention using educational technology (creativity).

The module uses the three views of computer science (mathematics, engineering and science) combined with a model of CT as a framework. The framework aids the teacher in designing the use of educational technology to support the integration of CT and STE(A)M. Each view provides a way to integrate CT with the corresponding subject. We interpret here the technology (T in STEM) subject to be covered by the engineering view. The prospective teachers learn to use the framework to plan the application of educational technology in their own teaching. The module concludes with a project work, where prospective teacher teams create designs for learning interventions using educational technologies to support CT and STEAM -based teaching. The role of arts (A in STEAM) in the design of the learning intervention is to give context, create engagement and allow room for creativity.