

Educate

the Thymio being an educational robot, it is not surprising that the primary goal of many user is to educate! Educators have the need to teach something, and to adapt it to who is learning, be they students, colleagues, or kids during an exhibition

Target topics exploit the thymio for targeted educational activities	CS/Robotic topic target the educational activity for topics in Computer Science or Robotics	generic make students approach CS or robotics
		specific organize activities with a focused pedagogical goal in mind: variables, memory, computer vision, AI...
		state of the art educate about the SOA to foster interest, enthusiasm and a sense of real life applications
	Others topic exploit the Thymio as an educational medium for conveying any content: the playful nature of the robot and many other aspect of it make it a genreal-purpose educational tool	soft skills promote the development of soft skills such as cooperation, communication, abstraction, compliance to rules and norms
		focused topic exploit Thymio to deliver educational activities that address a specific topic
		curricula compliance exploit Thymio to deliver educational activities that address a topic in support of the school curricula
Incremental Complexity educate according to the level of the learner: very different target users are possible, with different knowhow, background, age	Learning Curve engage students that are at different position in the learning curve relative to the competences they have been taught	novices address students that just started their learning process
		trained address students that can be autonomous and explorative in their activities
		proficient engage students that are already experienced (even with the robot); avoid to bore them
	Competencies engage students to acquire different skills according to their age	primary school support the development of abstraction skills
		middle school provide alternative paths to educate about a given subject
		high school educate about the real life application of what is being taught
Inclusion target kids with cognitive deficits; Thymio can open up new avenues with educational activities for the impaired	university apply advanced knowledge to tangible demonstrations	
	CAA engage students with cognitive disabilities in different ways through Augmentative and Alternative Communication	

Learn

learning may involve many different users: a student that has to complete a homework, a teacher that has to learn a new tool, and so forth

<h1>Autonomy</h1> <p>adjust learning autonomy during the process, depending on the educational context</p>	<h2>Guided</h2> <p>be guided in the learning process exploiting features provided by the system</p>	<h3>tutorial</h3> <p>provide a step by step guidance, like following a given set of instructions</p>
	<h2>Accompanied</h2> <p>actively involve other people in the learning process (i.e. buddies, parents, a trainer)</p>	<h3>goal based</h3> <p>provide guidance during the learning process and in the exploration of the robot capabilities by setting reachable goals</p>
		<h3>parallel</h3> <p>distribute roles to reach a common goal while working in group</p>
		<h3>concurrent</h3> <p>engage others team members to work together - suppor or being supported</p>
	<h2>Remote</h2> <p>permit students to be guided from a teacher while not being physically present</p>	
<h2>Independent</h2> <p>let users be independent while learning</p>	<h3>exercise</h3> <p>practice the concepts learned during class time through individual activities</p>	
	<h3>concept dive</h3> <p>grant the freedom of focusing on a new concept at a personal pace</p>	
<h1>Engagement</h1> <p>avoid barriers that can reduce the attention level during the learning effort</p>	<h2>Catalyzing Attention</h2> <p>let the robot be a didactic tool to improve attention; avoid to distract users</p>	
	<h2>Interaction Obstacles</h2> <p>prevent that possible interaction difficulties interfere with the learning process</p>	<h3>peripherals</h3> <p>release the leraning effor from interface through mouse, keyboards, trackpads and other pheripherals</p>
		<h3>setup</h3> <p>make the setup process easy and smooth, being itself a part of the learning experience</p>
		<h3>code syntax</h3> <p>simplify coding requiremnts; the code syntax must be easy and not an obstacle in the access of the overall topic (apart from the case in which the final goal is to learn the code systanx itself)</p>
		<h3>device agnosticism</h3> <p>avoid interaction patterns that typically belongs to specific operating system or devices</p>
		<h3>language</h3> <p>support by design learners that are not familiar with written language</p>
		<h3>CS/robotic concepts</h3> <p>provide access to the learning experience also when not familiar with CS/Robotics concepts</p>

Access to Robot

the Thymio being a promising robot, it is expected to have multiple ways to interact with it and access to its components

Physical/Simulated	get access to a physical or simulated robot	variable distance	provide for controlling access to the robot based on a dynamic, variable distance metric. This impacts on how services are distributable	cabled	manage robots via a hardwire connection (USB)
		single/multiple units	benefit in accessing a single or multiple robots by providing adaptive functionalities	via WiFi	manage robots via WI-FI network connections
		on demand	get access to robots without owning one	under same subnet	get control of several robots in a same subnet
				remotely	get control of robots without having physical robot access
code	write code and immediately see it executed on the robot: punctual execution of instructions by the robot				
support BYOD	get access to robots via any personal device	renting	exploit short-term loan of equipment for a fee as a services for specific contexts (i.e. exhibitions, evaluations, demos)	instruct	instruct the robot and passively watch it carring out activities: autonomous behavior of the robot
				FW update	provide support to the users that want to stay updated with the latest features
				observe	give the possibility to observe features of the robot while it is performing an assigned job
				remote access	getting control of one or more robot without being the owner
		lightweight	limit the usage of system resources, support also old devices		
		easy install	let the users automatically download, build, install, and manage sw packages		
		portable	reduce as much as possible the need to adapt the current operating system to the application needs		

Access to Activities

to be a valid pedagogical support, the Thymio must offer activites that are focused on a given topic and engaging at the same time. Educators have the need to retrieve educational kits designed to teach topics according to the student's age and learning objectives

Collections give a pedagogical service of high value providing a collection of contents	sorting search/sort activities by age, n. of people, n. of robots, topic, soft skills, ...
	curricula search/sorting activities in compliance with schools curricula, not limited to CS/Robotics
	inclusiveness integrate the activities in a platform for students with special needs
	remote/local load and save activities in a local device or upload/download remotely
Community engage the community in the design, maintenance and update of the activities	sharing share the activity and the own experience in the community of educators or students
	collect feedback receive an evaluation of the proposed/performed activities within the community
Follow-Up create metrics on the activities for tracking the effectiveness of both learning and education	track progress track scores, students improvement, and so on, for enabling a refinement process on the activities
	maximize participation track the results to create challenging activities and promote engagement

Setup

The setup phase needs to be adapted to an heterogeneous, possibly non-specialist pool of users. Setup activities refer to having the system ready for execution, including all those actions needed for software installation

easy support the set of users for which having a cumbersome setup is a limit to the product adoption such as primary school kids, non digitalized parents, and so on	guided be guided in the environment set up when this is part of the learning process, to understanding for example the architectural design or the hardware/software distinction
fast support rapid setup for situations in which timing is crucial (i.e. exhibitions, class demonstrations, dioramas)	
persistent and resilient ensure the setup is trustable to remain up and running for long time	piece replacement be able to easily set an autonomous behavior for a robot. If a robot is part of a group, support robot replacement and resetting the whole group
replicable support the replication of previous configurations without burden to the users	backward compatible support activities designed in the past, including sharing activities despite the version of the toolsuite