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KA201: Strategic Partnerships for school education

RoboPisces

"innovative educational ROBOtics strategies for PrImary School ExperienceS"

Newsletter No.4

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Editorial

Dear RoboPisces follower,

a year has passed since the project started. Even though the Covid-19 situation hit hard on our lives, many activities have been carried out in preparation of the second phase of the project. The RoboPisces team has been enduring in order to accomplish the project's results. Especially, the RoboPisces partner schools in Croatia, Greece, Italy and Malta are ready for the beginning of the school year. During the second and third year of the project, in fact, the activities will be focused on students as, according to the RoboPisces plans, the basic and advanced curriculum and tools will be introduced into classrooms. Pupils will be excited, a bit confused, probably also scared, but we have a big team all around Europe for taking care of them!

This year the RoboPisces team carried out an extensive mapping activity of existing curricula in Educational Robotics applied to STEAM in primary schools within the involved countries. Results highlighted that, although it is proved in numerous researches that hands-on activities with educational robotics help support the development of computational thinking, creativity, engineering competencies, social competencies, and other skills, it should be acknowledged that until now educational robotics is left aside from formal education. There is an attempt to organize robotics activities in line with national curriculums, but they are aimed mostly at particular groups of students. This approach can eventually lead to the marginalization of groups of students who are not involved in such activities.

The outcomes of this extensive mapping activity are summed up in the reccommendations fro the introduction of Educational Robotics into schools. Moreover, these reccomendations are taken into account in developing the RoboPisces curriculum, that will be organized around the fundamental and advanced topics of Robotics, environmental education and IoT and it will cover the next two years of the RoboPisces curriculum.

Along with this amazing worked leaded by the University of Latvia, the Università Politecnica delle Marche released the first version of the Robopisces toolkit. Soon these components will be upgraded and enriched with the help of teachers and thanks to the feedbacks from the schools.

In order to master both the concepts and the toolkit associated with the RoboPisces curriculum implementation, teachers are safely at home following the online course set up on the UNIVPM's OpenEdu platform. This virtual training has taken the place of the on-site LTTA C1 "Educational

Robotics to teach IoT and Marine Robotics at the primary school", that should have been held in Ancona during the summer but was cancelled due to COVID-19 emergency.

To all teachers, headmasters & headmistress and all school staff will go RoboPisces support to overcome the difficulties and help children stay in the schools happily and safely! The UnivPM staff wants to send you a virtual hug: together we will make it!

Stay tuned with the project progress by following our newsletters, social network accounts and web site (www.robopisces.eu), to be informed about future developments.

The RoboPisces team

1 Mapping activity

The risks associated with the usual educational robotics practices:

1. In compulsory educational settings lessons usually lasts 40-45 minutes, but robotics activities should be planned for at least 90 minutes. Specific lesson planning should be done to manage time properly.
2. Educational robotics activities are not in line with compulsory curriculum and in cases where it is, these activities are not included in curriculum but are organized as voluntary activities.
3. Sometimes teachers are not fully prepared to incorporate robotics activities in compulsory education. Teachers should be prepared to work both in a constructivist paradigm where students construct their knowledge during hands-on activities.
4. Students could drop out from organized activities due to various motivation, for example low motivation or not enough prerequisite knowledge.
5. Practical problems, like – damage of robotic kits, problems with the connection (internet, Bluetooth), charging problems, theft of robotic parts.

Indicating that there is no risks can be quite a big risk because no actions are taken to diminish those risks.

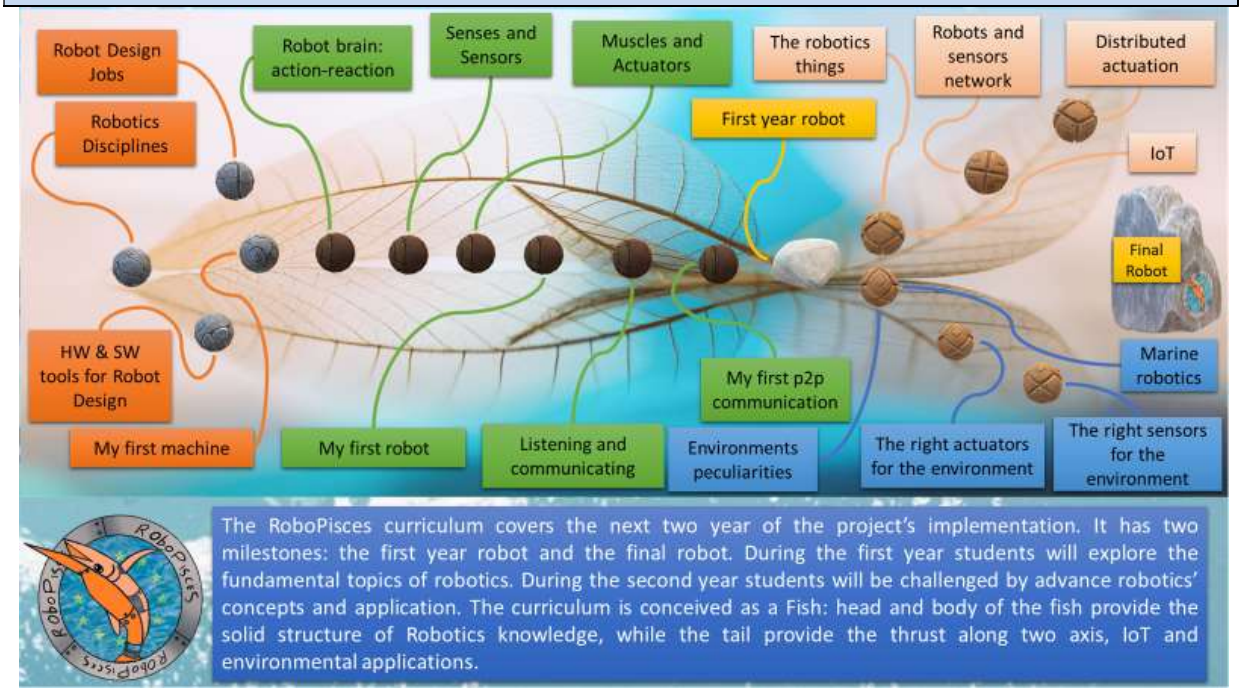
Recommendations after mapping results:

- The educational environment should be prepared for incorporating educational robotics in compulsory education,
- Lesson plans should be adapted to allow the organization robotics activities for 90 minutes in a row,
- Teachers should be prepared to organize hands-on educational activities, to use different approaches in cases when some students are not motivated and to explain robo-ethics aspects and legal aspects in use of sensors and free information flow,
- Learning spaces should be adapted for robotics activities – enough robotics kits, possibility to charge robotics kits and tablets or notebooks, access to the network, spare robotics parts, maker space to let students develop their own robotics parts,
- Activities to support inclusion of educational robotics in compulsory education are needed to ensure that every student has access to these knowledge and to ensure inclusive education taking in mind also hidden factors.

Skills have become the global currency of the 21st century. Without proper investment in skills, people languish on the margins of society, technological progress does not translate into economic growth, and countries can no longer compete in an increasingly knowledge-based global society

- OECD Secretary-General Angel Gurría

2 The RoboPisces curriculum



The RoboPisces curriculum covers the next two year of the project's implementation. It has two milestones: the first year robot and the final robot. During the first year students will explore the fundamental topics of robotics. During the second year students will be challenged by advance robotics' concepts and application. The curriculum is conceived as a Fish: head and body of the fish provide the solid structure of Robotics knowledge, while the tail provide the thrust along two axis, IoT and environmental applications.

3 The RoboPisces toolkit

Social distancing, masks and safety measures won't stop the RoboPisces team. At the Laboratory of Modeling, Analysis and Control of Dynamic System (LabMACS) of Università Politecnica delle Marche the RoboPisces toolkit is assembled with enthusiasm.
Teachers will be the first to explore the kit during the online training, and then students will challenge them with many interesting questions.

4 Teachers' training

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