

STEM in Early Childhood Education and Care (Croatia)



NATIONAL POLICIES

There is little to no information about educational robotics and STEAM in ECEC in Croatia. More focus is being directed into primary education.

As far as ECEC is concerned, the newest curriculum dates back to 2014. and robotics or STEAM are not mentioned in it. The closest it gets to STEAM field is mentioned through 8 key competencies for lifelong learning that were accepted and adopted from the EU practice and that are included and emphasized through national curriculum for ECEC.

GOOD PRACTICES

TinkerLabs - a Croatian educational franchise that offers a unique STEAM approach that includes science, technology, engineering, art, math, experiments and hands-on learning.

Ja RaSTEM - a multi-year interdisciplinary STEM program of innovative teaching of gifted elementary school students" co-financed by the European Union from the European Social Fund (ESF)

Stemalica - Through practical work, understanding theory, critical and analytical thinking and working in groups, the goal is to teach children from a young age how to use their knowledge to solve problems - first in the classroom, and then in the world.



CPD



Education and Teacher Training Agency - a platform where a lot of different opportunities to participate in national expert meetings can be found. It's important to point out that a lot of different reforms are focusing on "burning" problems that are not related to STEAM and/or robotics in this period of time, and these gatherings have to focus on them, rather than, for example, STEAM/robotics.

Along with the aforementioned agency for teacher education and training which is a public institution with the mission to create a new culture of education by permanently supporting the improvement of the quality of educational activities through continuous participation in the implementation of education reform, applying the best Croatian, European and world educational practices, we can also include here organizations/associations that offer educational content, activities, projects, training, etc. for teaching personnel like **The Croatian Association of Technical Culture (CATC)**, **IRIM (Institute for Youth Development and Innovativity)**, **CARNET or similar.**

But, it is important to note that for these activities to be recognized as relevant and as a part of continuing professional development for teachers, they have to be first approved by the Ministry.

GAPS & ROOM FOR IMPROVEMENTS

Teacher education is also critical for IT education. This is the number one problem for all subjects, but especially for computer science. We need to take into account the fact that in our schools only a small number of teaching staff are trained to create and present modern information technology in the teaching process. An adequately trained teacher can provide excellent education with minimal equipment. We think that any reform that would lead to changes in the program, that is, the curriculum as a key factor, is wrong. It is necessary to start first of all with the intensive education of teachers (of course, who should be adequately motivated for this through an appropriate system), and the education itself improves and develops the curriculum.

According to world experience, the most important factor in education reform should be the focus of attention on the teaching staff: improving the material and social status of teachers, stimulating quality, attracting talented young people with scholarships to the teaching profession and quality continuous professional development, especially for the STEM field, but also for other creative teaching (professional seminars, sample lectures, summer scientific campuses, occasional one-month research practice in scientific institutions, study trips, doctoral studies).



MAIN CHALLENGES



There is interesting research with even more interesting results done by Bencak Nikolina as a part of her master's thesis at the University of Zagreb, Faculty of teacher education. There were 228 respondents (teachers teaching in elementary schools) included in this research from schools from the whole of Croatia. It was a research that was focusing on educational robotics in schools around Croatia and the following responses were received (the focus here is on the ones that are most important in this context):

- most of the respondents answered affirmatively that they in fact have learning robots at their schools
- contrary to what one might think because of the first answer, most of the respondents answered that they do not use learning robots in their everyday work
- and continuously on the previous question, the majority of responses were negative when asked about whether or not their schools have workshops with the aim to teach children about robotics in their schools
- and, last but not least, most of the responses were positive when asked whether or not they are interested in additional professional development in regard to robotics

MORE

In Croatia, whether or not these topics will be applied in schools very much depends also on the financial situation of the school and its ability and will to provide up-to-date technological solutions needed for this type of education. We can say that, based on this research but also in general, schools are equipped with the necessary equipment, and there are more and more schools that are equipped with innovative and modern technological equipment/resources. That can be partly also thanks to different projects and programs that schools can be and are a part of more and more and through which they generate funds for necessary equipment. The problem begins when schools are equipped but don't have enough time or space, or even human resources to work on these topics.

To conclude, there are gaps and there are challenges that need to be worked on and that need to be worked on fast because multiple generations might miss something that we can, nowadays, think of as essential skills, given the time and surroundings that we're living in. But also, they can have a greater effect on career paths and professional development later on in life and, consequently, on the quality of life.