

## Four years of STEAM learning in elementary school

### – understanding the design and implementation of an educational program

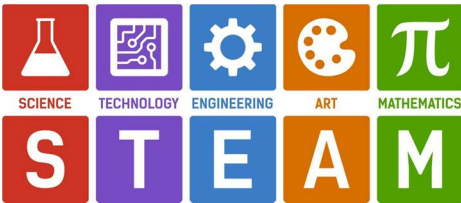
Mirela-Adriana Szitar-Sirbu, Simona-Elena Romas

Polytechnic University of Timisoara, Romania, Middle School No. 25, Timisoara, Romania

#### INTRODUCTION & AIM

##### Keywords:

STEAM; education; architecture; soft-skills; critical thinking



- **STEAM** education is an interdisciplinary approach that integrates science, technology, engineering, arts and mathematics in order to develop long-life soft skills, **addressing learning in a way that mirrors real life**. This new approach brought the **arts** into the equation, shifting the focus to critical thinking, understanding the world and finding creative solutions.
- The most relevant discipline for understanding the methods used is **architecture**, the field that brings together artistic and technical elements in a natural way, as part of the profession.
- A topic of interest for understanding STEAM education for children is **how this discipline could be taught to elementary school pupils**.

#### METHOD

- This article aims primarily to present the methodology developed by **De-a Arhitectura Association** in two manuals: "Playing architecture – mini" <https://de-a-arhitectura.ro/mini-ghid/> for the first and second grade and "Playing architecture in my town" for the third and fourth grade. <https://www.de-a-arhitectura.ro/proiecte/de-a-arhitectura-in-orasul-meu/>
- Second and perhaps more importantly is the whole process analysis, with exercises, experiments, the connections with other disciplines of the curriculum (math, geography, history, nature, sciences) and conclusions the authors reached after **four years** of working with **25 children** from the same classroom, tracking their progress and skill development.

#### RESULTS & DISCUSSION

Over the years, we have noticed that children who participate in such STEAM activities have a better understanding of the world around them and are better at making the connection between school and the real world.

"Playing Architecture" offers a methodology that can be easily adapted to different learning contexts and age groups, ranging from understanding people and the planet through stories to lessons on architecture that explore light, space, scale, and, ultimately, the city.

#### CONCLUSION

The **STEAM** approach is suitable for **all age groups**, and the tangible **results** are evident not only in terms of **hard skills** but especially in terms of **soft skills**, namely **problem-solving, communication, emotional intelligence, collaboration and creativity**.

#### FUTURE WORK / REFERENCES

As the authors have worked together with two different groups of pupils "Playing architecture in my town", in 2019-21, respectively 2024-2026, the next step is to make a comprehensive analysis of how this program can be developed in different contexts (during pandemics and the last to years).

Contact: [mirela.szitar@upt.ro](mailto:mirela.szitar@upt.ro), +40722493909

#### MAIN STAGES AND EXAMPLES OF ACTIVITIES

The final exhibition after the first year (2023) – "Playing architecture-mini" – **Planets and stories** – inspired by Little prince – children are learning about our environment and people using stories. Each planet has a different population: the animal lovers, the plant lovers, the learners, the dreamers, the travelers, etc.



**Learning about architecture:** learning about scale (How many children can fit in an elevator of one square meter?), about light and shadows (How do shadows change over the course of 30 minutes as the sun moves overhead?) etc.



The final exhibition after the third year (2025) – "My dream school" – a project started from scratch taking into account the children's wishes, with the teacher and architect serving as facilitators in a two-month process that ultimately resulted in a model (article: <https://ap.pensoft.net/article/34977/>)



**Learning about the city:** A debate workshop on how to build a neighborhood—role-playing exercise. How can we create a green city? How cheerful are the facades that look out onto a green space? A project in which pupils grew wheat in the spring and drew the facades of a green neighbourhood.



**Work in progress: We're moving to Mars. How do we imagine our homes and cities in this new world?**

The teacher and De-a arhitectura team have obtained parental consent to use the children's images.