

Andreea Elena BARBU¹
Florentina-Cristina MERCIU²
Diana STANCU³

„DE-A ARHITECTURA” PROGRAM: AN INTERDISCIPLINARY EDUCATIONAL MODEL LINKING ARCHITECTURE, URBAN PLANNING, GEOGRAPHY AND ECOLOGY

Abstract. Introducing architecture into the school environment through dedicated educational projects plays a significant formative role, extending beyond strictly aesthetic and technical dimensions. The aim of this paper is to highlight how „De-a Arhitectura” project, as a model of good practice for developing critical thinking and responsibility toward the built environment, contributes to enriching the school curriculum, particularly in relation to disciplines such as geography, ecological education, and arts, through an interdisciplinary and applied approach. This educational project has been implemented in Romania since the 2011-2012 school year. This initiative involves the implementation of interactive educational projects carried out in schools throughout an entire school year, based on methods that have been tested and officially recognized as pedagogically valid. „De-a Arhitectura” project promotes education for the built environment through activities adapted to primary, lower, and upper secondary education. This project facilitates the progressive understanding of concepts related to space, form, function, scale and ecology, maintaining students' motivation for learning. In Romania, the introduction of this educational project in schools represents a strategic initiative, given that awareness in and education regarding the built environment and urban and rural spaces remain insufficiently developed within the general curriculum.

Keywords: interactive pedagogy, built environment education, project-based learning, creativity, interdisciplinarity, civic responsibility, recycling

¹ No. 19 „Tudor Arghezi” Secondary School, Bucharest, Romania; correspondent author email: <andreea.barbu@scoala19tudorarghezi.ro>.

² University of Bucharest, Faculty of Geography, Bucharest, Romania; corresponding author email address: <cristina.merciu@geo.unibuc.ro>.

³ Architect, Bucharest, Romania.



1. Introduction

The relationship between school space and educational process is supported by intrinsic motivation, an essential element that connects students, teachers, teaching methods, the curriculum, the school environment, and the community (Mihăilescu 2020: 2). In context of the future school, the accelerated integration of technology across all fields of knowledge generates profound transformations in learning content, the types of competencies required, and the diversification of information sources (Mihăilescu 2020). The increasing complexity of contemporary societies requires the redefinition of educational models in order to equip new generations with solid scientific and technological competencies (Glass et al. 2024; Martínez et al. 2024; Taha et al., 2021). This challenge involves adopting innovative methodologies, modern educational tools, and multidisciplinary teaching activities (Martínez et al. 2024), that encourage students' active engagement in the learning process and in the community (Glass et al. 2024).

In this context, active methodologies have emerged as an alternative to the traditional teaching model, in which the teacher is the main transmitter of knowledge, and the student has a passive role, merely as a receiver of information (Martínez et al. 2024). A relevant example is the STEAM educational model, which includes the arts as an integrating element and promotes interdisciplinary, creative, and innovative learning situations, contributing to the development of an integrated understanding of scientific, technical, and artistic disciplines (Yim et al. 2025), and enhancing knowledge acquisition and meaningful learning (Martínez et al. 2024).

The relationship between society, buildings, and cities highlights the role of architecture as an essential element that strengthens this connection. The city, the neighborhood, or the dwelling represents the physical framework of everyday activities – educational, recreational, or professional – and is composed of buildings with various styles and functions (Martínez et al. 2024). The living environment, to which some residents may feel attached, can be understood as a set of buildings with different architectural styles, depending on their utility (Martínez et al. 2024). Most often, architectural details become visible only in the context of transformations such as renovations, restorations, demolitions, or

the construction of new buildings). Typically, responsibility for such interventions is attributed to architects, while public reactions often manifest intuitive, expressed through simple appreciations or criticisms sometimes formulated subjectively (Martínez et al. 2024), without a deeper understanding of the principles underlying these changes.

Society should not only use the city, but also understand it, enjoy it, and participate responsibly in its development (Martínez et al. 2024). However, this responsibility is not learned intuitively and requires appropriate training. The transformation of the city is not exclusively the responsibility of specialists, but also of the residents (Arin 2014), who, however, are not always sufficiently informed or trained to evaluate, adapt, or propose solutions aimed at improving the quality of life (Martínez et al. 2024). Therefore, the lack of knowledge regarding the built and geographic environment justifies the need to educate young people about the basic concepts of architecture, urban planning, geography, and ecology. These fields provide essential knowledge for understanding the limits and potential of the sustainable development of the built environment.

Numerous studies highlight the importance of introducing architectural concepts as early as primary school (Acer 2016; Arin 2014; Martínez et al. 2024; Sulima 2020; Zamfir, Mihăilă 2018) through dedicated educational projects, emphasizing their formative role beyond purely aesthetic and technical dimensions. Architecture can be easily integrated into the school curriculum by linking it with disciplines such as the arts, mathematics, or technology (Acer 2016), as well as geography, history, civic education, and music (Havaşi 2020). Such an interdisciplinary approach enables children to perceive the world as an integrated whole (Acer 2016) and to understand the connections between different fields of knowledge.

The importance of including architecture projects in pre-university education, adapted to different levels of difficulty, derives from the need to align educational content with students' stage of cognitive development. Such a gradual approach facilitates the progressive understanding of concepts related to space, form, function, scale, and ecology, avoiding conceptual overload while maintaining students' motivation for learning. At the same time, this approach is necessary for society, given the relatively low level of social awareness regarding historic buildings (Martínez et al. 2024). In this regard, early education represents one of the most effective

ways to protect cultural heritage and cultural landscapes, while also promoting the principles of sustainable development (Sulima 2020; Achille and Fiorillo 2022).

Furthermore, through practical activities, education in architecture provides children with experiences that highlight the dynamics of space and the built environment (Acer 2016), while fostering innovation, creativity, design skills, and teamwork (Arin 2014; Martínez et al. 2024). As future adults, they will be involved in decision-making process that influence the configuration and evolution of the communities they belong (Acer 2016; Glass et al. 2024). At the same time, architecture projects, integrated within active pedagogical methodologies, contribute to preparing children to respond effectively to current and future challenges (Martínez et al. 2024).

In most countries in America and Europe, architects' associations or various independent organizations organize programs and workshops dedicated to architecture education for children and young people (Acer 2016).

The program "De-a Arhitectura. Education for Architecture and the Built Environment," initiated in the Romanian school system in 2011 by the De-a Arhitectura Association (Order of Architects of Romania 2021), celebrated 14 years of activity in the 2025-2026 school year. This period has been characterized by the implementation of interactive educational projects carried out in schools throughout an entire school year, based on methods that have been tested and officially recognized as pedagogically valid (Igloo 2024).

In Romania, the introduction of architectural educational projects in schools represents a strategic initiative, given that awareness of the built environment and education regarding urban and rural environment remain insufficiently developed within the general curriculum. Such initiatives contribute to the formation of a critical awareness of the quality of the built environment, of cultural heritage, and processes of territorial transformation.

The aim of the paper is to argue how the "De-a Arhitectura" program, as a model of good practice for developing critical thinking and responsibility toward the built environment, contributes to enriching the school curriculum, especially in relation to disciplines such as geography, environmental education, and the arts, through an interdisciplinary and applied approach.

2. Methodology

The present study is based on qualitative research, focused on a descriptive-analytical approach. Several research methods were used in developing the study: documentary analysis, a case study represented by 'De-a Arhitectura' project as a whole and several selected mini-projects/workshops, the method of analysis and synthesis applied to the relationship between the interactive educational project and the school curriculum, content analysis of some educational mini-projects, as well as participatory observation.

The documentary analysis involved the selection and processing of information from the specialized literature on architecture education applied in pre-university education, as well as the consultation of guides and teaching materials from „De-a Arhitectura” educational program and the national curriculum. Correlated with the method of analysis and synthesis, this stage aimed to identify the pedagogical foundations of the educational program selected as a case study, to examine its objectives and methodologies used, its usefulness in developing the targeted types of competencies, and its alignment with the competencies provided in the school curriculum.

„De-a Arhitectura” program was treated as an educational case study, analyzing its structure, the typology of activities, levels of difficulty, and the degree of disciplinary integration. The authors also conducted a content analysis of selected workshops, focusing on active learning strategies, targeted competencies, interdisciplinary connections (architecture-geography-ecology-arts), as well as the integration of real-world learning contexts.

Participatory observation also constituted a relevant method, being applied by the teacher and the volunteer architect involved in the implementation of the project.

3. Results

3.1. Presentation „De-a Arhitectura” program

"De-a Arhitectura" program is dedicated to students in primary, lower, and upper secondary education and consists of a series of courses and

activities complementary to the current school curriculum. The objective of the program is to provide students with a basic understanding of the built environment and fundamental concepts of architecture and urban planning, alongside the knowledge accumulated in school in other subjects (geography, history) (Order of Architects of Romania 2021). The program was initially funded as a cultural project in 2015 by the Order of Architects of Romania (OAR), and later it gained the status of a priority cultural project.

Over time, this initiative has produced visible results in the development of pupils' competencies and has achieved numerous successes in promoting architecture education.

Participation in the project activities supports students' understanding of the built environment which they live and carry out their daily activities through experiential and interdisciplinary learning. The approach integrates elements of technological education, mathematics, digital literacy, practical skills, local history and geography, and civic education. Students explore architecture and the built environment both from a citizen's perspective and from that of professionals such as architects, urban planners, or landscape designers, fostering critical awareness of citizens' responsibility toward the spaces in which they live (Order of Architects of Romania 2021).

The implementation of this educational program is carried out through a collaborative model that involves resource persons (volunteer architects) who work with teachers, forming mentoring teams (Igloo 2024). This interdisciplinary formula creates a complex educational framework, in which the professional expertise of architects is integrated into the pedagogical process, ensuring both conceptual rigor and practical relevance. The continuity of this initiative is due to the dedication and involvement of teachers who, step by step, guide pupils through a unique educational experience. By integrating architectural concepts into interdisciplinary teaching, professors provide children with new perspectives on the world (Igloo 2024).

The structure of the projects is adapted to the stages of cognitive development and to the competencies specific to each age group. The typology and level of difficulty of the projects are correlated with the level of understanding associated with each educational stage. In primary education, activities are correlated with elements of the school curriculum regarding environmental exploration and the development of observation

and spatial representation skills. Thus, for grades I and II (ages 6-9), the program “De-a Arhitectura mini” is carried out; for grades III and IV (ages 9-12), the program “De-a Arhitectura in My City” introduces children to issues related to the city and public space; while the educational program for lower and upper secondary education (ages 12-18), “My school Can Be Cool (De-a Arhitectura in My School)” stimulates critical reflection on the built space (De-a Arhitectura Association 2024; Sava et al. 2016).

3.2. Presentation of several workshop / projects' examples

The team, composed of a teacher and an architect, guides the students in observing and analyzing the built urban environment. The general competence targeted by the program for grades I and II focuses on identifying the interdependent relationship between the characteristics of inhabitants and the specific features of the natural and built environments in which they live. Intuitively, children discover concepts related to architecture and urban planning while traveling alongside Little Griffy and Little Seed, two imaginary dragons through different countries: Land of Water People, Land of Little Animals, Land of Hardworking People and Land of Lazyfolk (fig. 1 a, b, c, d).



Figure 1. Fairy tale houses made by first grade students
(Source: Barbu A. E.)

As students progressively develop their crafting skills and acquire new knowledge about the geographical environment in the second grade, such as flat landforms (plains and deltas) or mountainous relief, they engage in the creating scale models representing types of dwellings adapted to different natural environments. In the case of the coastal

environment (Fig. 2a), students analyze particular characteristics such as the proximity to the sea, wind action, and high humidity, and reflect on how these factors influence the form, orientation, and materials used in construction. Architectural solutions adapted to climatic conditions are discussed, including appropriate roof designs, strategically oriented windows, the use of moisture-resistant materials, the presence of terraces, and houses raised on stilts.

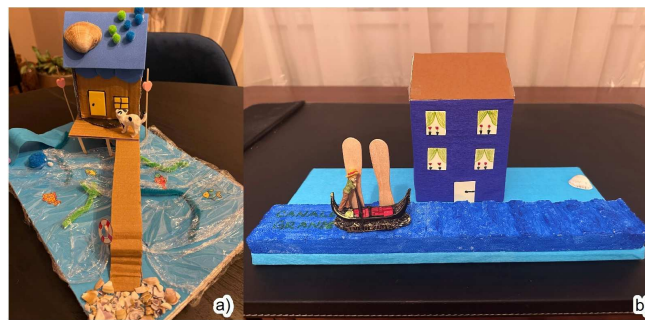


Figure 2. Typical houses from coastal (a) and lagoon (b) environments created by second-grade students
(Source: Barbu A. E., Merciu F. C.)

In the case of the lagoon environment (Fig. 2 b), students observe the relationship between buildings and the presence of water, their integration into the natural landscape (such as the canals within the city), and the types of transport adapted to the characteristics of the geographical setting. Through the creation of scale models, children do not merely reproduce architectural forms, but also understand how buildings adapt to the specific features of the geographical environment, becoming aware of the interdependence between natural factors and human intervention. This activity contributes to the development of spatial thinking, with housing perceived as the result of the interaction between nature and society.

In the third and fourth grades, students also take part in urban exploration activities (Fig. 3a), which allow them to discover the surrounding environment and experience it through multiple senses. Students receive a set of guiding questions designed to support their investigation of the built environment.



Figure 3. Urban environment exploration (a) and the creation of a scale model representing housing types within a historic urban fabric (b)
(Source: Barbu A. E.)

For example, during the first exploration activity, third-grade students were informed that they would explore the surroundings of the school in order to observe the relationship between the scale of the built environment and their own body scale. Working in teams, they searched the tallest and the smallest buildings in the area and measured the width of the street or the façade of a building using their own bodies. The list of guiding questions also included: How does my perception of the built environment change with distance? What materials did you observe? How do you think the natural environment looked in the past?

Students are then asked to apply the concepts learned in class by developing various individual creative projects in the form of scale models during workshop activities, analysing the data, photographs, and materials collected during the exploration. At the end of the school year, a collective project is carried out in teams (Fig. 4 a, b, c). The workshops are among the students' favorite activities, as they provide opportunities to practice crafting skills and develop new ideas in an environment where experimentation is encouraged and mistakes are not emphasized.

A simple exercise thus becomes a meaningful learning experience. A wide variety of materials are used, including paper, modeling clay, sticks, and packaging materials, demonstrating how, with little imagination, everyday objects can be creatively transformed into important elements of a project. Finally, students present their work to their classmates or as part of an exhibition (Fig. 4), particularly in the case of the collective project. In doing so, they overcome their fear of speaking and explain the reasoning behind their choices.



Figure 4. Scale models representing neighborhoods (a, b) and playgrounds (c) presented at „De-a Arhitectura” Exhibition organized at the „Ion Mincu” University of Architecture and Urbanism (Bucharest, June 2025)
(Source: Barbu A. E., Merciu C.)

3.3. Results of „De-a arhitectura” educational program

The learning outcomes are aligned with the key competencies outlined in the national education framework, but they also include knowledge, skills, and values that are not commonly addressed in other educational programs in Romania. These include understanding the relationship between the socio-cultural context and the built environment – bridging social sciences and natural sciences – as well as an integrated approach specific to education for sustainable development, which simultaneously considers environmental protection, heritage conservation, and social and economic development (Igloo 2024).

Throughout the implementation of the „De-a Arhitectura” program, 37,334 students from public schools, ranging from primary to high school level, have participated, with the support of 1,430 teachers and 1,300 volunteer architects (De-a Arhitectura Association, Activity Report, 2024). Initially implemented in major urban centers in Romania (Bucharest, Timișoara, Cluj-Napoca, Sibiu, Arad), the program was later extended to rural areas and, in recent years, has been implemented in 36 counties (Fig. 5).

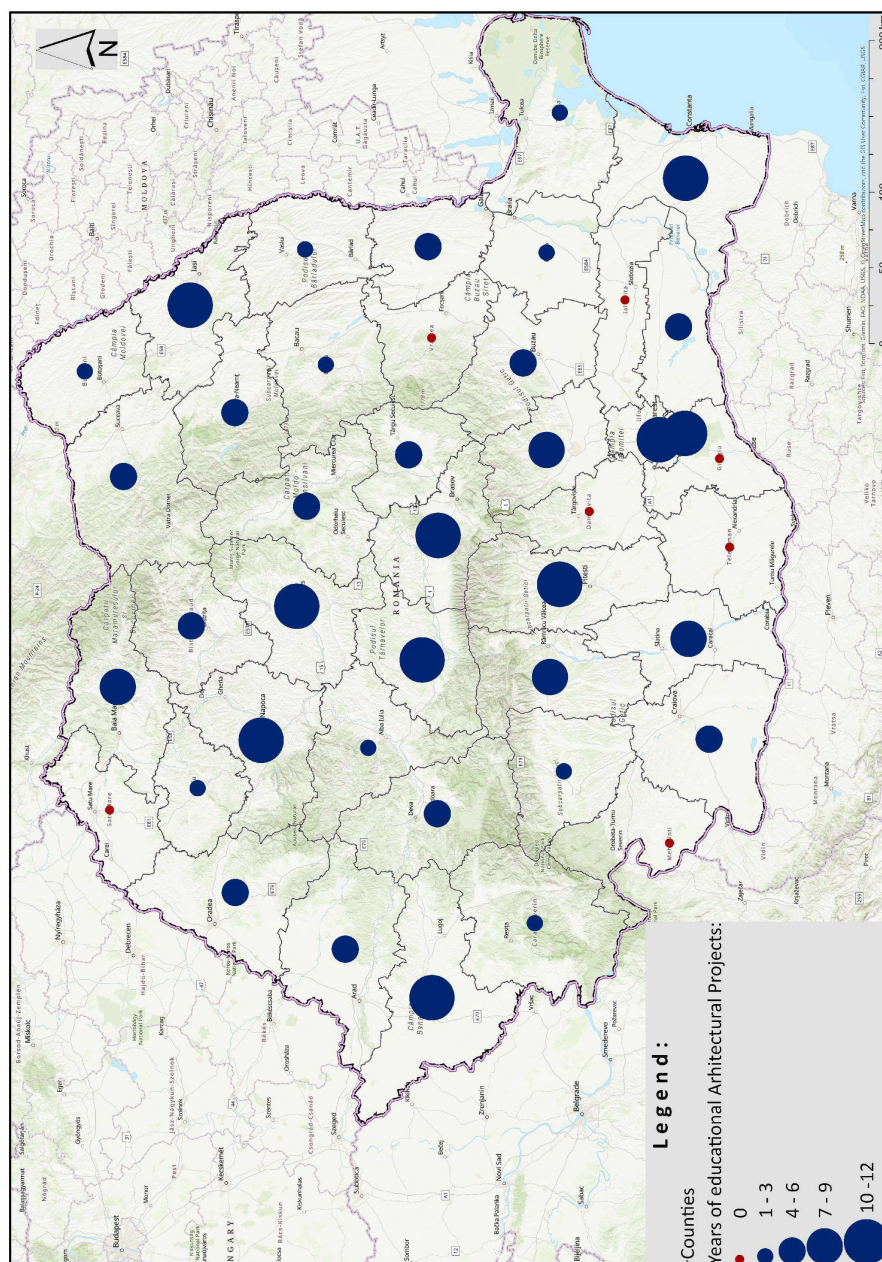


Figure 5. The territorial distribution of „De-a Arhitectura” project at the county level (2012–2024)

(Source: results obtained by the authors based on the processing of data presented by the „De-a arhitectura” Association, Activity Reports 2012-2024)

Education in architecture develops students' ability to analyze the built environment while fostering responsibility toward public space and cultural heritage. It enhances spatial perception and visual literacy and encourages students to understand communities as complex systems in which decisions about buildings, green spaces, and infrastructure affect quality of life. Such initiatives also strengthen civic awareness by promoting responsible planning, sustainability, and heritage protection. By extending learning beyond the classroom, these programs help younger generations develop a sense of belonging and a better understanding of the importance of integrating historic buildings and heritage areas into contemporary urban development. Moreover, the transition to geography concepts introduced in the fourth grade becomes significantly easier.

A defining feature of the program is its interdisciplinary character. The proposed activities integrate concepts related to architecture, urban planning, geography, and ecology, facilitating the understanding of the relationship between space, community, and the natural environment. Students are introduced, in an age-appropriate manner, to concepts such as spatial orientation, urban structure and functions, and the interaction between built and natural environments, while developing basic geographical competencies and early ecological awareness. The connection between visual arts and recycling in primary school activities increases children's environmental awareness (Mendizabal 2022) and encourages responsible attitudes toward resource consumption. The ecological dimension is further addressed through the use of recyclable materials, particularly reused paper and cardboard, in the creation of scale models. Through the proposed activities, students do not merely accumulate information but also assume active roles – as observers of space, novice designers, and analysts of their own city. This active engagement fosters the development of an early identity related to the field, which the literature describes as the initial stage in the formation of vocational identity (Niță et al. 2018). Although the direct impact on university choices was not measured in this study, participation in such programs may increase awareness of these fields and positively influence future educational and professional decisions.

5. Conclusions

This study highlights the relevance and coherence of „De-a Arhitectura” educational project within primary education, emphasizing its contribution to the development of observation skills, spatial representation, critical thinking, and responsibility toward the built environment.

Furthermore, this educational initiative may play a significant role in stimulating students’ vocational orientation by providing early exposure to professional fields related to the built environment, such as architecture, urban planning, and geography. By fostering spatial thinking, creativity, and the ability to analyze the relationship between the natural and built environments, students may discover interests and abilities relevant to these professional paths. In this sense, the program goes beyond a strictly disciplinary dimension and can be placed within the broader framework of career education, contributing to the early shaping of students’ educational interests and aspirations.

However, the findings of the study should be interpreted in light of certain methodological limitations. First, the research considered only a selection of projects implemented at the primary school level, without extending the analysis to programs designed for lower and upper secondary education. Second, the study did not include questionnaires or interviews with teachers and volunteer architects involved in the implementation of the educational project.

Future research will focus on extending the investigation to all educational levels included in the program and on integrating both quantitative and qualitative research methods (such as questionnaires and interviews). Such an approach would allow for a more comprehensive assessment of the program’s educational impact and its interdisciplinary character, including its influence on students’ educational orientation.

In conclusion, even within the limits of the present analysis, the „De-a Arhitectura” programs for primary education emerge as a relevant instrument for fostering a culture of the built environment. The educational program contributes to the development of essential transversal competencies necessary for shaping future active and responsible citizens, while promoting interdisciplinarity, ecological responsibility, and openness toward fields such as geography, architecture, and urban planning.

References

- Acer, D., 2016, «Children and architecture: architectural design education for young children in Turkey», in *Childhood Education*, vol. 92, pp. 99–110.
- Achille, C., Fiorillo, F., 2022, «Teaching and learning of cultural heritage: engaging education, professional training, and experimental activities», in *Heritage*, vol. 5, pp. 2565–2593. <https://doi.org/10.3390/heritage5030134>
- Arin, S., 2014, «Built environment education for children through architectural workshops, in *Procedia-Social and Behavioral Sciences*», vol. 143, pp. 35–39.
- Glass, E., Urrea, C., Diaz, J., 2024, «Steam learning architecture: a framework for educational innovation », MIT Open Learning.
- Havaşi, B. R., 2020, «Architecture and children The space as a youth education environment», PhD. thesis summary, Politehnica University Timișoara, PhD. Domanin: Architecture, available: https://arhiva.upt.ro/img/files/2019-2020/doctorat/teze/rezumat/Havasi_Rezumat_teza_eng.pdf, accessed 03 February 2026
- Martínez, J., Montés, N., Zapatera, A., 2024, « STEAM Architecture – a STEAM project for pre-university studies to connect the curricula with architectural concepts », in *Education Sciences*, vol. 14, 1348. <https://doi.org/10.3390/educsci14121348>.
- Mendizabal, U. S., 2022, « Art and recycling in primary education », *4th Interdisciplinary and Virtual Conference on Arts in Education (CIVAE)*, Book Series CIVAE, X, pp. 302–306, MusicoGuia
- Mihăilescu, O., 2020, « Towards a responsive understanding of sustainable school architecture», *IOP Conf. Series: Materials Science and Engineering, Proceedings of the 5th World Multidisciplinary Civil Engineering-Architecture-Urban Planning Symposium*, Prague, Czech Republic, 960, 032106, pp. 1–11. doi:10.1088/1757-899X/960/3/032106.
- Niță, M. N., Clius, M., Gavrilidis A. A., 2018, «The impact of geography curricula on employability: a student perspective», in *Romanian Review of Geographical Education*, vol. 2, no. 2, pp. 5–22.
- Sava, M., Croitoru, C., Grigorescu. M. (coord.), 2016, «De-a arhitectura în orașul meu / Ghidul îndrumătorului», available: <https://www.de-a-arhitectura.ro/wp/wp-content/uploads/2016/10/GHIDUL-INDRUMATORULUI-daa-in-oras-2016.pdf>, accessed 21 February 2026.
- Sulima, M., 2020, «Children as conscious recipients of space. The role of architectural education in the process of teaching », *IOP Conf. Ser Mater. Sci. Eng.*, 960, 032004
- Zamfir (Grigorescu), M., Mihăilă, M., 2018, «Preuniversity learning buildings architecture as sustainable discourse. From the individual to the community space / Arhitectura clădirilor de învățământ preuniversitar ca discurs sustenabil. De la om la spațiul comunității »,
- Taha, H. S., Abed Hassan, S., Abrahem S. A., 2021, «Interactive architecture: concepts, objectives, applications review», in *International Journal of Engineering, Management and Humanities*, vol. 2, no. 5, pp. 20–26.
- Yim, I. H. Y., Su, J., Wegerif, R., 2025, «STEAM in practice and research in primary schools: a systematic literature review», in *Research in Science & Technological Education*, vol. 43, no. 4, pp. 1065–1089. <https://doi.org/10.1080/02635143.2024.2440424>

Igloo, 2024, «De-a Arhitectura în cel de-al 13-lea an în școlile din România», available: <https://www.igloo.ro/de-a-arhitectura-in-cel-de-al-13-lea-an-in-scolile-din-romania/>, accessed 28 december 2025.

Ordinul Arhitecților din România, 2021, «De-a arhitectura Program de educație de arhitectură și mediu construit pentru copii», <https://oar.archi/proiecte-oar/proiecte-in-desfasurare/de-a-arhitectura/>, accessed 29 december 2025.

Asociația De-a Arhitectura, 2024, Rezultate de activitate, Raport de activitate 2024, available: https://www.de-a-arhitectura.ro/wp/wp-content/uploads/2025/10/raport-anual-2024_A4_2.pdf, accessed 16 February 2026

All links were verified by the authors and found to be functioning before the publication of this text in 2026.

DECLARATION OF CONFLICTING INTERESTS

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

FUNDING

The authors received no financial support for the research, authorship, and/or publication of this article.

Creative Commons Attribution-Non-commercial-No Derivatives 4.0 International License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)