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*Special Issue 1.2025*

## Innovation, green infrastructures and urban form Towards regenerative city models

In the contemporary global context—characterized by increasing environmental pressures, demographic asymmetries, and socio-economic fragmentation and structural inequalities—the relationship between urban form, ecosystem services, and territorial innovation acquires unprecedented strategic value. This Special Issue intends to critically explore and foster a new interdisciplinary debate aimed at rethinking the urban project within a framework of regenerative and systemic transformation.

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Innovation, green infrastructures and urban form.  
Towards regenerative city models

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## *Special Issue 1.2025*

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## The creative co-design of collective spaces

Two case studies of generating new spatial and social infrastructures

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### Abstract

In recent decades, the education of minors has been compromised by high rates of educational poverty, further exacerbated by the COVID-19 pandemic. This situation reduces the effectiveness of social infrastructure – the fourth pillar of infrastructure alongside green, blue, and grey infrastructures – that underpins the welfare of national and local entities and encompasses the spaces and artifacts that host social, cultural, and economic activities.

The “P.arch. Playground per architetti di comunità” project (P.arch. Playground for Community Architects), aimed at addressing educational poverty, has piloted an innovative educational pathway based on creative activities and engagement with territories and communities from an inclusive and regenerative perspective. The P.arch project involved schools in socio-economically fragile contexts in Sicily and Lazio regions, developing four modules, including “Creative Architecture,” which enabled students to design public and school spaces. Through these activities, new shared spaces and Community Hubs were created to promote social inclusion and community education. Students acquired both cognitive and non-cognitive skills, contributing to an innovative model of community development.

This contribution, therefore, highlights the importance of educational processes for generating new connections within the social infrastructure system. It aims to demonstrate how active education and youth engagement are essential for addressing educational poverty and fostering social well-being.

### Keywords

Co-design; Collective spaces; Urban regeneration; Community Engagement; Cityforming protocol

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## 1. Introduction

### 1.1 The Educational Function of Collective Spaces and Co-design

In recent decades, a global context has emerged where cities enhance their communication potential and services for citizens, the issues related to school learning among minors and school dropout rates continue to increase. These factors are closely linked to economic poverty and are more prevalent in contexts with significant socioeconomic lag. Opportunities for educational, physical, and socio-emotional growth are crucial for children and adolescents. For this reason, Save the Children introduced the concept of "educational poverty" in Italy, defined as «the deprivation experienced by children and adolescents of the opportunity to learn, experiment, develop, and freely flourish their abilities» (Save the Children, 2014, p. 4). They also developed the first Educational Poverty Index, based on 14 indicators analysing the accessibility and quality of educational offerings and the levels of minors' participation in recreational and cultural activities.

If the situation was alarming before the COVID-19 pandemic (Save the Children, 2019), today, closures and restrictions have significantly increased the risk of material poverty and generated a significant "learning loss." According to recent studies, globally, the number of children and adolescents in poverty is estimated to have risen from 582 million in 2019 (approximately 32% of the total) to 715 million (38.4%) in 2020. In Italy, according to Save the Children (2022) and ISTAT data on the living conditions of minors (ISTAT, 2023) 1.3 million children live in absolute poverty (compared to 1 million in 2019). More than one in four children is at risk of poverty and social exclusion. Additionally, 67.6% of children under 17 have never gone to a theatre show, 62.8% have never visited an archaeological site, and 49.9% have never entered a museum. Furthermore, 22% have not engaged in sports or physical activities, and only 13.5% of children under three have attended a nursery.

In this scenario, a new educational paradigm is necessary, focusing not only on individual performance but also on social growth and relationships. This paradigm should address the challenge of promoting the development of both cognitive and non-cognitive skills, such as dynamism, cooperation, empathy and openness to culture and experience. It should stimulate complex and critical thinking, strengthen emotional bonds and the development of listening skills and a sense of community, and create conditions conducive to developing artistic and creative abilities.

It is also essential to consider not only the existing dynamics of disadvantage that impact educational poverty but also – if not primarily – to awaken a sense of responsibility towards their territory, city, and neighbourhood, in the younger generation. This approach aims to rebuild a new sense of community and ensure that the community itself becomes the guardian of the local context's material and immaterial qualities.

In this context, the "P.arch. Playground per architetti di comunità" project (P.arch. Playground for Community Architects), research project fits in, aiming to implement strategies to counteract educational poverty through the experimentation of an innovative and replicable educational process based on creative methodologies and active, open, and project-oriented relationships with the territories, with a focus on urban regeneration. Paying particular attention to fragile contexts, the project has promoted strategies to establish stable educational centres in some peripheral areas, positioning the school as a strategic driver of development and change (Gisotti & Masiani, 2024). It supports the school in its role of creating better and more responsible global citizens through collaboration with universities, institutions, and associations, and involving teachers and families to form new educating communities.

The concept of an educating community refers to a group of individuals, institutions, and organizations that collaborate to create an integrated and inclusive educational environment aimed at promoting the learning and development of community members, especially the young. This approach recognizes that education occurs not only in schools but also in families, workplaces, and other social contexts. Therefore, an educating community creates a continuous and integrated learning environment where every interaction and experience

contribute to individual and collective growth, aiming to form responsible, competent, and aware citizens capable of positively contributing to society, to define a new urban humanism (Pultrone, 2014).

The importance of collective spaces has been central to the experimentation, aiming to recover, transmit, and recognize the “sense of community”, refers to a feeling of belonging, interconnectedness, and shared responsibility among group members. It involves an emotional and relational bond that strengthens social cohesion and mutual support.

Additionally, the project seeks to define the differences between “space”, understood as a physical or geographical entity, and “place”, which is considered a socio-cultural entity. These are to be understood as expressions of the society that inhabits them, social spaces where a sense of belonging is recognized, where identity is built. These spaces must be designed with the community, fostering inclusion, social cohesion, and a sense of belonging, and have the capacity to promote and support deep and lasting changes, both tangible and intangible, in the urban environment (Ashwort, 2008).

The identification and design of urban areas for regeneration, to have an educating and empowering function, have been approached in the project as a participatory, collaborative process in which various actors, such as school children, citizens, organizations, public and private entities, work together to conceive, develop, and implement solutions to common problems or challenges.



**Fig.1 Schematization of the educational function of collective spaces and the co-design process**

## 1.2 Planning in a social and spatial unequal city. A complex challenge to tackle

The contemporary socio-spatial context has become extremely multifaceted, and therefore, to define an adequate theoretical context for the case study described in this article, it is necessary to consider different topics increasingly relevant and interconnected with each other:

- the relationships between humanity and nature, which provide a backdrop for a renewed approach to humanity's role on the planet;
- how humanity builds 'infrastructures,' understood primarily as artifacts that modify nature and produce impacts on space;
- the role of education as an opportunity to raise awareness regarding the previous topic;
- the role of urban and territorial planning within this complex framework.

The complex relationships between humans and the planet have prompted deeper reflection on humanity's transformative role on Earth. Crutzen & Stoermer (2000) define the Anthropocene as an era where human actions are geologically significant. In contrast, sensitive designers are exploring positive solutions through ecological urbanism, as highlighted by Mostafavi & Doherty (2016), who advocate for new paradigms that foster harmonious interactions with ecological systems. Carta & Ronsivalle (2020) envision a creative Neo-Anthropocene based on symbiosis with nature, while Carta (2024) introduces a holobiontic hypothesis, emphasizing the interconnectedness of individuals and communities within their environments. This perspective underscores that infrastructure should not merely overlay the biosphere but integrate complex social and spatial relations essential for urban environmental quality (Shannon & Smets, 2016).



International organizations now favour a holistic view of infrastructure, as noted in the “Climate Change 2022: Impacts, Adaptation and Vulnerability” report (Pörtner et al., 2022). This definition encompasses various infrastructures as products of integration and co-design, supported by governance system that enhances community relationships and promotes economic growth, health, and quality of life.

According to the definition provided by the IPCC, however, there is a type of infrastructure – the social one – which consists of social, cultural, and financial institutions and activities that support community well-being. This fourth infrastructure underpins the welfare state of national and local contexts and also includes the places and artifacts that host these functions.

The school is probably one of the most important social infrastructures – in reducing socio-spatial inequality (Mela & Toldo, 2019) –, as it fosters the thinking of the communities of the coming years.

Really, the significant urban function of the school as an interconnected social infrastructure has been highlighted in numerous studies across different fields, such as urban economics, educational sciences, and urban planning. For example, it can be recognized that where the urban fabric is more tenuous and the density of urban opportunities is lower, educational outcomes are of lower quality (Gibbons & Silva, 2008), and this often leads to a vicious cycle that progressively worsens the initial condition.

However, where the school becomes a cooperative social infrastructure, it is possible to achieve overall improvement outcomes (Ralls, 2019), also concerning the redesign of shared space between school and city (Miles et al., 2023).

The role of educational processes that enable the creation of new connections within the social infrastructure system appears significant. Carta (1999) discusses the importance of territorial and urban cultural heritage as a key element in identity building, citing, among other things, the social and identity functions of cultural heritage as defined by UNESCO (1972) and later reiterated by Fabrizio (1995). The key challenge is to integrate educational objectives into a coherent local strategy and to promote cross-sectoral integration, acting simultaneously on both fronts: that of social inclusion and the fight against inequalities and poverty (Colantonio, 2011). Integrated urban strategies should include interrelated actions to improve the economic, environmental, climatic, and social conditions of urban areas.

For this reason, educational action with younger generations is a significant part of constructing social infrastructure, its spatialization, and the ability of communities to produce systemic projects that harmoniously involve the infrastructures as defined by Pörtner et al. (2022).

Experts in urban and regional planning play a relevant role in tackling both education and urban regeneration challenges in order to improve social infrastructures, and a frequent point of contact between education and the challenge of urban regeneration is found in the so-called 'argumentative turn' in planning (Fischer & Forester, 1993).

Really, community engagement and support, participative approaches and co-design activities are a relevant part of the “communicative turn” in urban planning. The still-ongoing shift of planning practice toward a more cooperative and participatory process of urban production (Forester, 1999; Healey, 1997) spurs the development of numerous methods and techniques for participation in planning processes. Planning theorists described this progressive change as the “communicative turn” (Healey, 1996), closely related to the “argumentative turn”.

Based on this view, urban planning is increasingly seen as a communication process that balances the interests and needs of different stakeholders in the city. This approach promotes integrative actions across social, economic, and spatial domains, as noted by Carta (2017). Urban development faces challenges such as globalization, demographic changes, and financial constraints, often overwhelming municipalities' creative and economic capacities. Therefore, cooperation among various actor groups and an interdisciplinary approach is essential. Sustainable urban planners must address these demands to ensure spatial compatibility and viability.

Education has emerged as a key factor in urban development, especially in areas highlighted by Save the Children (2022), where opportunities are limited, and schools serve as critical cultural and legal anchors. In these contexts, discussions around education and training infrastructure are vital for fostering integration and societal participation. Initiatives aimed at improving educational access in marginalized neighborhoods are crucial for addressing socio-spatial disparities and mitigating polarization exacerbated by economic crises.

Knowledge and skills acquisition, as well as lifelong learning, raise questions about a suitable neighbourhood context and how places of learning are designed. In Southern Europe, where traditional educational models may not adequately address diverse populations' needs, innovative approaches to educational infrastructure are essential. This includes creating flexible learning environments that accommodate both formal and informal education, fostering community engagement and support (UNESCO, 2015).

Furthermore, the design of educational infrastructure and the social urban development of deprived neighbourhood programs must be context sensitive. Programs should reflect the cultural and social dynamics of the neighbourhoods they serve, ensuring that they are not only accessible but also relevant to the local population. These programs are created in tandem with urban planners and designers and implemented in communities to ease educational inequality.

In cities like Barcelona and Lisbon, collaborative efforts between local governments, educational institutions, and community organizations have shown promise in developing integrated approaches to urban regeneration that prioritize educational equity. Such initiatives can lead to sustainable urban development that empowers residents and enhances overall quality of life.

Subsequently, starting from the argumentative turn in planning and the integrated vision of socio-spatial infrastructure, the article makes a common thread that connects these themes, using an operational method to leverage the educational context in order to enhance awareness of what quality of life means for citizens — starting with the youngest students in primary and secondary schools — as a key component of socio-spatial equity, which is a fundamental part of the project for a new creative and non-destructive Anthropocene. This article, at a glance, presents the method, application, and results of a field research activity developed within the framework of the project P.arch. Playground per architetti di comunità.

The results stem from a customized co-design process for open spaces in schools involved in the project in Favara (Agrigento, Sicily) and Rome (Primavalle). A school in Palermo (San Giovanni Apostolo) adopted a similar methodology but with unique adaptations not covered here. The following paragraphs detail the objectives and modular organization of the P.arch Project, focusing on the Creative Architecture 2 Module led by the UniPA research group. The methodology, actions, and results are outlined through three phases of the workshop conducted in Rome and Favara. Ultimately, applying social innovation with youth enhances systemic efforts to address the Anthropocene crisis.

## 2. Materials and method

### 2.1 The P.arch project

The activities – whose results are reported here – were carried out by the research group from the Department of Architecture<sup>1</sup> as part of the project “P.arch. Playground per architetti di comunità”, a project selected by “Con i Bambini” Social Enterprise under the Fund for the Fight Against Child Educational Poverty (project lead: Farm Cultural Park, Favara, Italy).

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<sup>1</sup> The research group from the DARCH at UniPA was led by Prof. Maurizio Carta, Scientific Coordinator for DARCH and contact person for the Scientific Committee for the project. The authors of this article, Prof. Daniele Ronsivalle and Prof. Annalisa Contato, each had specific roles within the project: Prof. Ronsivalle served as the Governance Contact for the project (regarding the I.C. Falcone Borsellino School in Favara and I.C. Via Maffi in Rome), while Prof. Contato was responsible for the Creative Architecture Workshops (also concerning the I.C. Falcone Borsellino School in Favara and I.C. Via Maffi in Rome).

Starting from Save the Children's definition of educational poverty (2014), the project aimed to address this issue through policies, projects, and experiments designed to develop educational wealth, strengthen the educating community, and transform the city itself into an educational city capable of offering its inhabitants growth opportunities.

The experiment involved the regions of Sicily and Lazio<sup>2</sup> to ensure a widespread impact of the project, suitable for a comparative and evaluative analysis that ensures coverage in Southern and Central Italy. The choice of territories was also guided by the involvement of schools located in marginalized areas, not only in their geographical location (such as metropolitan peripheries or hard-to-reach places like Favara, a town in the Sicilian hinterland) but also in their socio-cultural dimension. These are fragile territories with high rates of educational poverty, school dropouts, social distress, and issues of multi-ethnic and multicultural integration. Thus, these territories lack personal, cultural, professional, and social growth opportunities for young people. In these "sample" contexts, educating children in new design practices thus becomes a resource for reimagining abandoned or underutilized spaces (due to neglect by the responsible public institution) within the school premises. By broadening the perspective to the neighbourhood's urban context, it also serves as a way to reimagine new urban spaces in the perspective of urban commons (Esopi, 2018) as collective resources that are enriched through individual interaction, increasing the value of the urban system, improving quality of life, and fostering cooperation, social capital, creativity, and encouraging the community in participation and co-design processes (Scheiber & Mifsud, 2024).

The P.arch project thus experimented with an innovative and replicable educational process, based on creative methodologies and active relationships, structured into four parallel modules: 1) "Creative Architecture 1", in this module children studied their local areas and developed regenerative projects based on their needs, as well as principles of environmental sustainability and integration (D'Amico, 2024); 2) "Creative Architecture 2", in which children designed both the internal and external spaces of schools and solutions to regenerate neighbourhoods, producing projects to build pieces of Augmented City (Carta, 2017; 2021) where space sharing and collective interest are predominant; 3) "Territorial Storytelling", within which children created tourist itineraries that combined the history of local heritage with their personal stories and organized guided tours conducted by themselves; 4) "Urban Gaming", using Minecraft children redesigned unused/underutilized areas.

The research group from the Department of Architecture was responsible for the "Creative Architecture 2" module, experimenting with the concept of "educational wealth" through the guiding principle that the city is the primary "entity" (and not just a place) that contributes to enriching its inhabitants.

A "rich educational city" offers its inhabitants a full range of growth opportunities, and the city, with its spatial and social organization, is an integral part of the "educating community". Spaces and architecture play a profound educational role, and when this role is enhanced by citizen participation, they can create conditions for cultural growth.

## 2.2 The "Creative Architecture 2" Module

The Creative Architecture 2 Module of the P.arch project focused on the tangible realization of the "rich educational city", helping students to think about the spaces in their neighbourhood as starting points for rediscovering their identity, sense of community, and fostering responsibility towards public spaces for collective use (Carta, 2022). It also integrated the school into the concept of a "place open to the community", where different generations can meet and grow together, furthering the idea of an educational community.

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<sup>2</sup> The schools involved in the project were: Comprehensive Institute (C.I.) "Falcone Borsellino" in the municipality of Favara (AG); C.I. "Giuliana Saladino" in the municipality of Palermo; and C.I. "Via Maffi" in the municipality of Rome.

To achieve the project's goals, Module 2 proposed a list of elements capable of enriching the city to help the community overcome educational poverty conditions and strengthen social fabric and personal identity, including:

- Greater synergy between conceived, perceived, and experienced spaces through new modelling of the "right to the city";
- More spaces for local storytelling, following the model of community spaces or interpretation centres;
- More libraries accessible to children, serving as squares of knowledge and relational space, public cognitive-relational spaces;
- More open spaces for play, providing opportunities for emotional interaction with urban space (utilizing opportunities offered by urban gaming);
- More positive urban landmarks that can serve as tools for inspiration and urban identity building;
- Increased direct experience in the performing arts (both as participants and spectators), enhancing the emotional dimension of the city;
- Reduced commercial desertification and spatial-functional homogenization, with a return to urban multifunctionality, countering both gentrification and hipsterfication;
- More fluid and permeable spaces to accommodate and nurture the multiple communities living in increasingly cosmopolitan cities, able to harness local opportunities and global vitality.

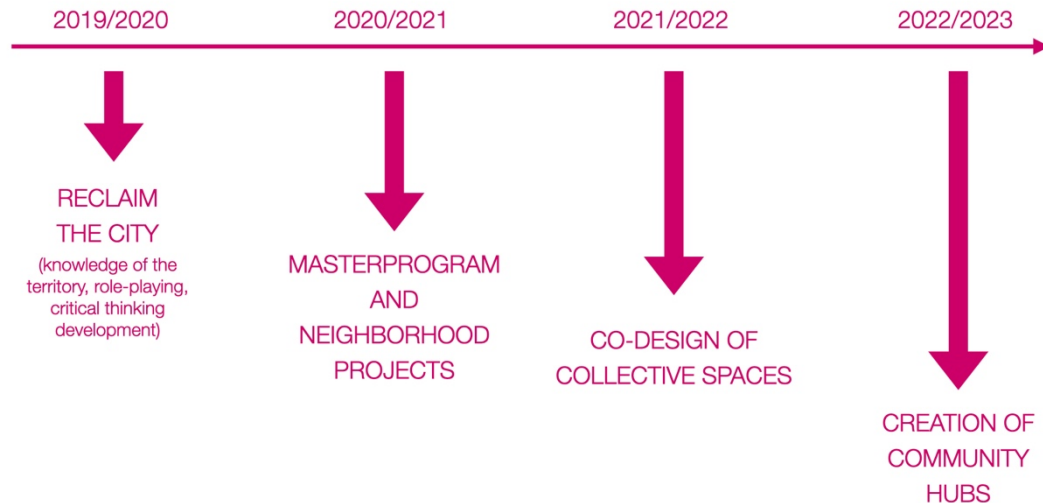
All these elements were central to the educational experimentation of the Module and served as guiding principles throughout the four years of field application (Fig.2).

In the first year of activities, "play" was used as a tool to guide children in understanding their neighbourhood spaces, identifying solutions for transforming and regenerating the urban context in which they live to build parts of city where space sharing and collective interest would be predominant. To achieve this, the Module used the paradigm of the Augmented City that "perceives the demands of a society more networked and knowledge-based, that answers to the global change and new circular metabolism. [...] Augmented City acts simultaneously on cultural, social, environmental and economics components to activate a human/urban regeneration" (Carta, 2017:7).

They also learned to identify quality, well-being, inclusion, and creativity objectives derived from the Augmented City Circle (Carta, 2017), which were translated into design devices they created, applying the process of the Cityforming Protocol (Carta, 2015). This Protocol is a self-regenerating process able to reactivate by stages the stationary metabolism of an area, starting from its talent regenerative components, acting for incremental and adaptive steps required to produce partial results that become the foundation of the next generative phase. The application of this planning protocol allowed for identifying those places and actions that could serve as "creative colonies" (the first step of the Protocol) meaning initial sites from which the transformation process could start with minimal financial commitment and then evolve and expand in subsequent phases due to the effects produced by the initial interventions.

In the second year of the Module, the children developed a general program for the urban context (a sort of master plan) and engaged in co-design activities for both the interior and exterior spaces of the schools, where previously identified places for "colonization" were located. The design dimension thus ranged from the urban context scale (urban spaces and connections between spaces and functions) to the building scale (the school). The third and fourth years of Module 2 saw the activation of co-design and subsequent co-realization of collective urban spaces within the interior and exterior of the schools, aiming to create stable Community Hubs - a school space capable of enabling a variety of relationships and offering opportunities, also in connection with the needs of the neighborhood's residents (Bianchi & Moscarelli, 2024) - , starting from tactical urbanism applications (Bazzu & Talu, 2016; Boglietti et al., 2024; Casanova & Hernandez, 2014; Lydon & Garcia, 2015).





**Fig.2 Objectives of the Creative Architecture Module 2 Across the Four School Years**

### 3. Results produced in the individual work phases

#### 3.1 The Game “Reclaim the City”

As Module 2 aimed to develop an innovative and replicable educational model based on creative and enjoyable methodologies to enhance both cognitive and non-cognitive soft skills in children, the proposed approach integrates two specific methodologies: project-based learning and authentic learning.

The adopted methodological approach aims to serve as a model through the use of fun and creative tools (game construction and gameplay), as well as more traditional tools such as reading, writing, and drawing. By applying these tools children are guided to understand the importance of interacting between different forms of creative expression and to recognize/discover their unique talents.

The methodology included theoretical and workshop sessions and direct involvement of the children in designing projects for transforming the places they regularly inhabit and/or traverse.

In the first year, children participated in a role-playing game, group work, urban context walks, and workshop activities to stimulate their expressiveness, and creativity, and enhance relational skills. They were encouraged to practice presenting their thoughts and the outcomes of the workshops, a moment of growth and self-awareness aimed at boosting self-esteem and enhancing soft skills.

In detail, the following teaching methodologies were adopted:

- Informal cooperative learning to proactively develop problem-solving skills and social abilities;
- Problem solving for the development of common knowledge and design objectives, to be applied in the development of the game “Reclaim the City”;
- Simulation for applying the game “Reclaim the City” and evaluating the project outcomes;
- Problem-based learning during the phase of assessing transformation objectives, simulation, and project realization.

The teaching methodology of the game was chosen to stimulate the children’s creativity and develop relational processes with their peers. The game method, which was designed and implemented with students, serves as a moment of sharing and creativity. It allowed them to design the urban context of their lives and, above all, to view transformation as a “reclamation” of spaces and identities.

The game is based on an approach where the places to be “reclaimed” are the endogenous components of the urban context (strengths and weaknesses), and the means (or weapons) of reclamation are represented

by the design tools that can be used. The purpose of the game was to produce a map of future transformations for the urban context where the school is located and where the students live.

All components of the game (board, playing cards, and rules) were created by the children themselves, with guidance from the UniPa research group.

During the Module, the students carried out the following activities (Fig.3): identifying the endogenous components of the area through a “neighbourhood walk” and on-site discussion; reading and understanding the neighbourhood map and recognizing the places/endogenous components; creating the game base (board) by drawing the map of the urban context on which all possible places of interest to reclaim/transform were marked; creating objective cards, which contained the definition of the desired functions through writing and drawing; creating “weapon” cards, made both by writing and drawing to define the design tools needed to achieve the goals; creating character sheets, aimed at understanding the importance of stakeholders’ roles and identifying the “mayor” with veto power over the project; writing the game rules; conducting the game: creating a draft map of the transformation colonies of the urban context around the school; presenting the results and new narration.

The Module allowed students to develop and strengthen their cognitive and non-cognitive skills, particularly technical skills in drafting projects for creating Augmented Cities. The activities provided the opportunity for children to develop critical thinking about the places where they live and/or spend their daily lives, enhancing their sense of community and the importance of participation in growth processes, both personal and in terms of the community sense they are aiming for (Francis et al., 2012).



**Fig.3 The Phases of the Game “Reclaim the City”**

### 3.2 Playing with Bricks to build future scenarios

The objectives of the second year were to develop critical and complex thinking through the technique of guided discussion, leading students to reflect on the outcomes of the role-playing game conducted during the first workshop and they were encouraged to evaluate whether the identified design solutions needed to be integrated and/or modified. The concepts of space sharing and collective interest were established as the foundation for enhancing the overall vision of the quality of the entire urban context.

However, the second year was characterized by the restrictions due to the Covid-19 pandemic, which required students to work individually. Therefore, the Module activities had to revise the teaching, both to prevent

individual difficulties from negatively impacting the educational richness objectives and to still construct a unified overall project in which all students, individually, participated by contributing in synergy with the class group.

For these reasons, it was decided to experiment with the use of bricks for both constructing the model of the reference urban context and for designing urban regeneration projects in urban contexts identified by the students as potential “colonies” of the urban regeneration process.

Through playing with the bricks, creativity (Schulz et al., 2015) and the pleasure of working together were stimulated, even though the students worked individually on the operational tasks. This contributed to the creation of a model of the entire city, which was useful for improving the understanding of spatiality at the urban scale (already initiated during the first year’s activities) and for stimulating further reflections on the necessary transformations (Fig.4).

The use of this tool ensured that each student could work individually and safely, and the ease of using the bricks, which do not require specific technical skills (unlike, for example, manual drawing activities that could challenge students who do not yet have good drawing abilities), allowed all students to develop their creativity with simplicity. Additionally, the students’ autonomy, the value of group work and community strength were emphasized by organizing the activities so that each student built a piece of a whole.

The children’s creativity was stimulated through various constructions with the bricks, which also allowed for an assessment of their abstraction and vision skills. Initially, each child was given a base plate corresponding to a portion of the base map to “reconfigure” and a set of bricks. This way, even though each child worked individually, they all collectively contributed to the creation of the model of the reference urban context. This model served as the basis for subsequent reflections on which areas and/or buildings to intervene in to implement actions of urban regeneration.

The students all alternately experimented with the design of open spaces and enclosed areas. The creation of urban projects saw an increase in the students’ creative and collaborative phases, expressed through spontaneous coordination for the development of complementary projects located in specific areas of the city. The use of this method/game, although initially designed to address issues related to the health emergency, proved to be highly effective. Not only was it easily replicable and adaptable to various educational experimentation needs, but it also strongly stimulated both individual creativity and the ability to work complementarily with the entire class. This approach activated both cognitive and non-cognitive skills.



**Fig.4 The methodological and operational steps for the implementation of the Masterprogram and neighbourhood projects**



### 3.3 Co-design of collective spaces and the creation of Community Hubs

The last two school years focused on the co-design and co-creation of communal spaces, with the aim of establishing a Community Hub as a stable presence for the community. In this project, co-design was understood as an approach aimed at broad and complex transformation processes, integrating the concept of social innovation and evolving towards the idea of an open process where a multitude of small, participatory initiatives interact to achieve a broader vision (Manzini & Rizzo, 2011).



**Fig.5 The operational phases of the co-design of collective spaces**



The co-design process implemented was understood as a participatory process throughout all its phases, from ideation to realization (Sanders & Stappers, 2008), following key principles such as: “active participation”, where all involved parties are invited to contribute ideas, knowledge, and experiences; “collaboration”, where teamwork is essential for achieving shared and integrated solutions; “inclusivity”, promoting broad participation to represent diverse perspectives and needs; “transparency”, as the process is open and clear to all participants; and “innovation”, as the combination of various skills and viewpoints stimulates creativity and innovation.

The activities carried out primarily focused on several key points:

- Imagination: stimulating imagination through representation and creation of drawings, writings on various themes, with the goal of activating free and as unstructured as possible creative processes;
- Body and Space: getting acquainted with one’s own body, the body in space, both individually and collectively, through exercises exploring the external spaces of the school complex;
- Material: getting acquainted with construction materials, their texture, and the possibilities of transformation, assembly, and finishing. Creating small artifacts/prototypes from loose pieces of wood and other materials like cardboard;
- Design by Doing: project and experimentation trials starting from drawing exercises and the words collected around the proposed theme. The space is engaged through the collective creation of project prototypes intended for realization;
- Construction: building habitable devices starting from prototypes assembled during the experimentation process. During the construction phase, the children become familiar with tools and construction techniques, managing all phases of the process independently with the support of the Unipa research group.

The two years of this phase allowed for the completion and implementation of what was achieved in the first year of co-design, increasing the difficulty level of the product due to the students’ now attained awareness of the different phases of the process and the cognitive and non-cognitive skills they had developed.

The ability to work in groups, coordinate, and complement each other through all phases was widely achieved. Additionally, there was an increase in creativity, accompanied by greater awareness of one’s abilities and the concepts of urban regeneration and the importance of public space.

All the students chose to work on creating a communal space within the only green area present in the school complex, recognizing it as a refuge from overly built areas and as a contributor to individual and collective well-being, more attractive and pleasant to live in than other locations.

## 4. Conclusion

Research has shown that activities conducted in socioeconomically diverse contexts with young people for the innovative development of grassroots co-design processes can be crucial in producing a new model of community development.

The absence of public institutions responsible for the spaces subsequently transformed by the tactical actions of the P.arch project led to the starting condition and the project’s demand for the development of this new experimental model of community development.

Previous situations of inefficiency and functional poverty in some areas highlighted the need to activate collective resources in Favara and Rome-Primavalle to fill the gap left by the public sector, through actions in urban commons aimed at enriching individual interaction, improving quality of life, and fostering cooperation and creativity. The P.arch initiative has enabled the start of a process to consistently meet the needs of the community and individual citizens. Numerous examples, even at very different urban scales, reveal the need to initiate such processes to rebalance – through the strength of communities – the functional deficits of our cities (Esopi, 2018).

The development and outcomes of the project have demonstrated that the educational action with the young generations of Favara and Rome-Primavalle has played a significant role in building community awareness. This can lead to the strengthening of the social infrastructure, its spatialization, and the capacity of communities to produce systemic projects that harmoniously involve the four infrastructures defined by Pörtner et al. (2022) for regenerating the urban environment.

Social innovation can ensure the transition to regenerative city models where the engine for a new development paradigm lies in the young generations. When trained in socio-spatial relationships as well as in basic cognitive skills, they can develop an evolutionary mechanism for urban development aimed at promoting actions that provide environmental, social, and economic well-being, leading towards a new integral ecology (Francesco, 2020).

However, the challenges to be addressed and resolved in social innovation processes such as those implemented by the P.arch project and the Creative Architecture Module 2 are still significant for disciplinary advancement. A new settlement strategy is indeed necessary to ensure that these experimental processes can guarantee stable innovation. This strategy must take into account numerous aspects. First and foremost, the integration of co-design within governance processes is essential. This includes regulatory planning and land-use designation, the formulation of general urban regeneration strategies, and the social and economic management of neighbourhood realities. Indeed, there are examples of tactical urbanism or unconventional bottom-up actions (such as guerrilla urbanism, guerrilla gardening, etc.) that, after an initial phase of enthusiasm, have left behind debris, with no continuity of intervention or stable development (Bazzu & Talu, 2016; Casanova & Hernandez, 2014; Lydon & Garcia, 2015). The second aspect concerns the actual ability of these interventions to stimulate widespread transformation. In other words, can a prototype of transformation be capable of altering large spatial contexts, often suffering from social poverty conditions as discussed in the earlier sections of this article? Certainly, the commitment of the local administration is crucial to ensure the dissemination and socio-spatial embedding of the approach introduced by the project within the relevant urban context. The third aspect concerns, as a final consequence, the economic sustainability of such interventions. Interventions funded by public bodies, NGOs, cultural foundations, and social enterprises are financially sustainable as long as the funding flow can support the process; however, the sustainability of socio-spatial transformation may falter, leading to physical neglect and social disheartenment due to the sense of abandonment. To ensure that the process can be elevated to a different, more stable, and replicable level with upscaling, it is necessary to adopt incremental and adaptive urban regeneration processes, such as the Cityforming Protocol (Carta, 2015), to provide a concrete possibility for the medium-term development of tactical and grassroots transformation projects that have evolved over these years.

## Author Contributions

This contribution is the result of the research activities of the P.arch project. Both authors contributed to the formulation and conceptualisation of the survey problem and the construction of the empirical basis of the article. However, the drafting of paragraphs 1.2; 2.1; 3.2 and 4 are to be attributed to Daniele Ronsivalle; the drafting of the paragraphs 1.1; 2.2; 3.1; 3.3 and 4 are to be attributed to Annalisa Contato.

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## Image Sources

Fig.1: Elaboration by the authors;

Fig.2: Elaboration by the authors;

Fig.3: Elaboration by the authors;

Fig.4: Elaboration by the authors;

Fig.5: Elaboration by the authors.

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