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**Accelerating Innovations.****Wellbeing and Requalification of School Buildings after the Pandemic. Towards a “New Extraordinary”**

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**Abstract**

The lockdown caused by the COVID-19 emergency has emphasised why the school is a physical realm of learning spaces influencing cognitive, emotional and affective relationships that cannot be surrogated by distance learning technologies. Besides, the subsequent need of physical distancing has highlighted the lack of resilience of Italian school buildings. Given that Health is not only safety but also wellbeing, the quality of spaces is crucial for learning, wellbeing and inspiring behaviours. Yet, the pre-pandemic “ordinary” of school buildings and debate in Italy was marked by endemic inadequacies and *clichés* respectively, which are discussed by the paper in relation to their poor resilience to physical distancing and on the base of the fieldwork conducted for Milan Municipality. Considering the new requirements of health measures as a potential accelerating factor, the authors delineate new principles of spatial setting and adaptive strategies for school buildings’ resilience to meet the new requirements while overcoming the endemic need of innovation and requalification of Italian schools, moving towards a ‘new extraordinary’.

**Parole Chiave**Resilience — Learning architecture — Space and wellbeing

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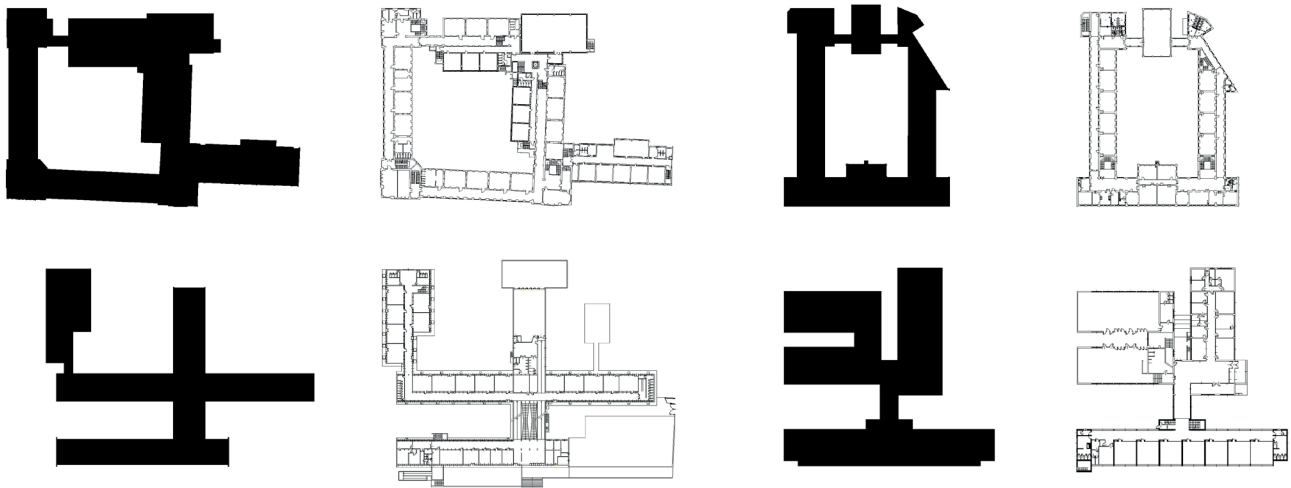
The lockdown caused by the COVID-19 emergency and the need of physical distancing have emphasized a general lack of resilience of school buildings and the urgent need to explore new parameters and ideas in their requalification. Besides, the global schools’ closure in response to the pandemic has presented unprecedented risks to children’s education and wellbeing (UNESCO, UNICEF, WB, and WFP 2020).

Although virtual learning enabled teaching students, it has exacerbated socio-economic and geographical areas inequalities due to unbalanced accessibility to technological devices and Internet network. Besides, the overall quality of educational processes has weakened, not to mention the increasing phenomena of “digital autism”.

While public administrations wish for returning as soon as possible to the ‘ordinary’, the Italian educational buildings’ reality before pandemic was that of an endemic need for requalification, upgrade and innovation that goes back to the aftermath of World War II (Rogers 1947, 1953-54; Pezzetti 2012) as denounced in the 12th Triennale di Milano entitled *La casa e la scuola* (1960).

According to the data presented by the Italian Ministry of Education (MI), among the 58,842 school buildings (MIUR 2019; MI 2020), more than half were built before 1976 and about 30% have been adapted from other functions. The rest are usually pre-fabricated “containers” based on a rigid classrooms-corridors system (the last often less than 2.4 metres large) lacking sufficient communal free spaces. Moreover, classrooms are

usually small and overcrowded and are generally not resilient beyond the number of twenty-two students. When the first protocols for physi-



**Fig. 1**  
Different school buildings types  
in Milan from “Abaco di Aule e  
Tipologie”.

cal distancing issued by the Ministry of Public Education adopted the “dynamic metre”, their degree of resilience was close to zero. The “static metre” adopted later (MI 2020) became a necessity to ensure school reopening in September 2020.<sup>1</sup>

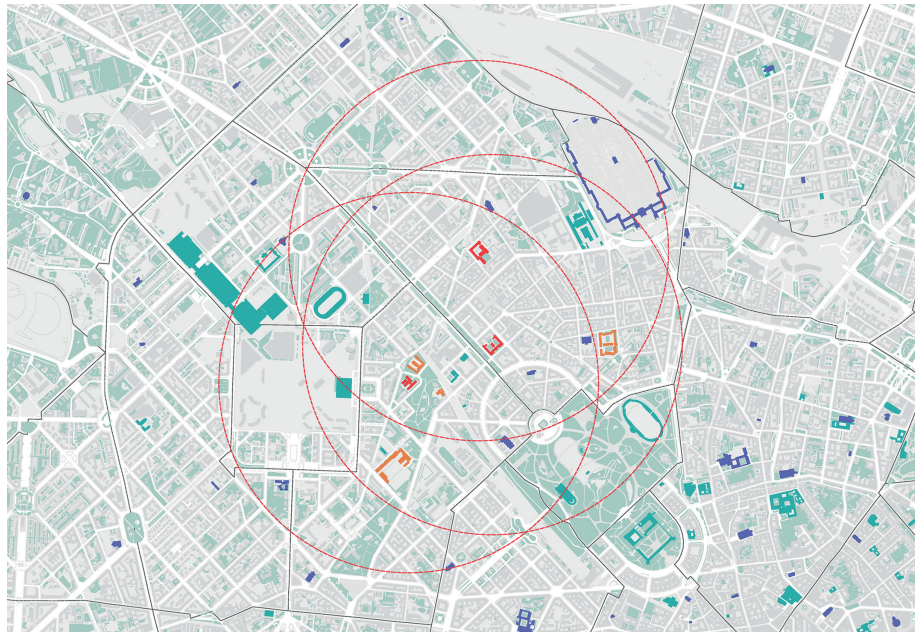
Besides, the lockdown has unquestionably highlighted that the school is a physical realm of learning spaces influencing cognitive, emotional and affective relationships that cannot be surrogated by distance learning tools and technologies. Space, as the “Third Teacher” (Malaguzzi), is also crucial in health, wellbeing, and behavioural characteristics of individuals. It creates the pre-conditions that enhances or impedes learning outcomes (OECD 2010). Indeed, the qualities of this physical realm are also desirable learning outcomes in themselves.

«Architectural space is not only an active player in influencing the conditions of learning and development, but is also a constitutive element in the formation of thought and a specific tool of critical, cultural and imaginative knowledge of reality. Organising space means organizing the metaphor of knowledge» (Pezzetti 2019, 2015).

However, even before the pandemic, architectural space was weakened in the potential and meaning of its codes and syntax by the unstructuring role accorded to digital technologies favouring blurred learning environments. Within the *cliché* of 2.0-3.0 schools (soon 4.0) and for some mainstream pedagogical approaches, the collaborative participation of learners focusses mostly on the interaction with technological fetish-object (IWB or BYOD). “Ustructured schools”, assuming the ideology of open plan, were seen by many as the schools of the future.

Yet, a scenario that substitutes a structured architectural space with a fluid or modular environment is the least resilient during a pandemic. The new requisites, such as compartmentation in stable groups, physical distancing, control of people flows and air changes, are now challenging and questioning old and new “dogmas” of school innovation. Often dictated by a mechanic “translation” of pedagogical theories in spatial layouts, both old corridor-schools and new “unstructured schools” proved they are not resilient to changing needs, such as the physical distancing in stable and restricted groups.

The work conducted by the authors on a large number of schools for Milan Municipality by the Osservatorio Scuole (OS)<sup>2</sup> shows that the schools organised by corridors form the majority of the existing buildings, no



**Fig. 2**

Schools and urban resources in a range of 15' in Milan, Municipio 8.

matter their period or type. Because of their classrooms' limited dimension (41-45 sm), distancing not only calls for abolishing the "chicken roost classrooms" introduced by the Gelmini Reform, but even to reduce the standard number of students per class below the critical level (twenty-two). In existent corridor-schools the possibilities to extend teaching outside classrooms are low, as the latter are arranged rigidly along narrow corridors and lack further communal spaces.

Health and renovation issues therefore converge towards the need to increase the surface of classrooms and communal spaces as well as their reciprocal porosity, suggesting also the grafting of new volumes or spatial layers, which would also upgrade the quality and performances of facades.

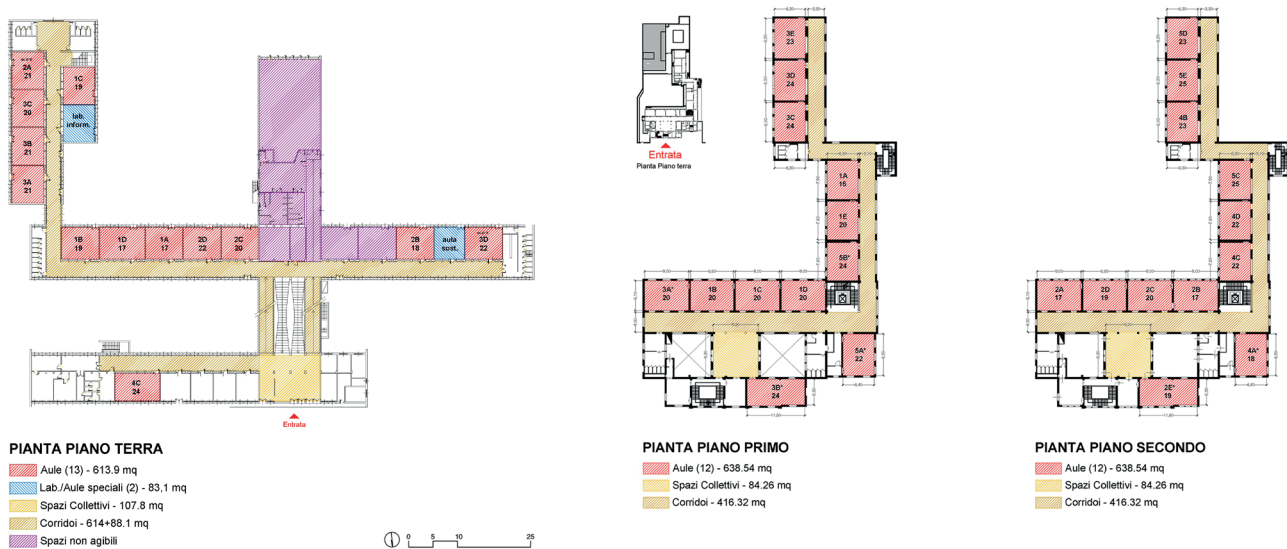
In turn, the abolition of classrooms forecasted by "unstructured schools" undermines resilience since stable classroom-groups cannot be compartmented and flows can hardly be controlled.

Besides distancing issues, the fluid environment of technology-driven *cooperative learning* leads to *unstructure* the entire school into an informal open plan. As boundaries become blurred, the school's various realms lose their distinctive architectural character. The potential of the tactile and dynamic exploration of physical space, the manner in which the activities are structured, and the boundaries between individual and collective space seem to give way to the seduction of a despatialised reality to be experienced in an architecturally undifferentiated "container" (Pezzetti 2019).

As form and thought are linked, when the open plan is assumed as a pedagogical ideology, learning space tends to reflect the informal and dissolutive character of contemporary *liquid society* and its *non-places* described by Augé (2008). When knowledge is made to coincide with information, the experience of space becomes that of a nomad who wanders from workshop to workshop with a *tablet* underarm. Yet, if the school's spaces become indefinite, there is no longer much left to explore, exchange, or recognise (Hertzberger 2008).

Schools, as public buildings, are cultural manifestation of a given society and assets for local communities. Their life cycle is longer than shifting pedagogical models. Spatial innovation should never depend on



**Fig. 3**

Primary schools *Console Marcello* (arch. A. Arrighetti, 1956) and *Rasori* (established in a former military barracks in Milan).

any specific view on education, which is just a starting point for design. Architects should instead explore spatial conditions that favour and widen the possibilities for learning within a general framework that is flexible enough to respond to continuous changes in educational pathways (Hertzberger 2008) while being characterised around durable themes and spaces (Pezzetti 2019). The challenges of resilience in pandemic and in face of shifting pedagogical models seems now interconnected.

Schools should aspire to duration as they constitute the legacy of our time for the future. The Greek-Roman Gymnasiums, although in ruins, are the emblem of a merciless contrast with the banal modularity of our time. If architecture is what creates beautiful ruins (Perret), the contrast between the school by Vittorio Garatti in Cuba and the remains of one of the thousands schools-containers makes clear which one features a spatial idea in a pure state of ruin and which one is only wreckage. The new upgrades and designs urged by pandemic resilience may deviate from this inclination of our time to produce only rubbles (Augé 2003).

The role of space makes clear that the present emphasis on “innovative furniture”, recently reinforced by the Government’s supply of desks and chairs, is misleading if the spatial qualities of schools remain conventional and poor.<sup>3</sup> Significantly, as Ernesto Rogers declared in 1947, «the problems of education cannot be accomplished without a *learning architecture*».

While architecture is a language, the vague and indeterminate concept of *environment* is not. Modularity and open plans appear as easy shortcuts compared to researching spatial articulations that enable students to recognise different *space-places* and degrees of responsibility while exploring self-learning possibilities.

Typological experimentation joint to architectural themes enables investigating new structuring principles to which subordinate innovative spatial organisations for the home base-classroom and space-units, thus expressing a sense of unity, identity and construction for the school’s community.

Along this line of thought, and considered the inadequacy of existing buildings and design guidelines, the post lockdown Phases 2 and 3 should not pursue the return to the ordinary situation before the pandemic. Rather, they should envision a “new extraordinary” and develop innovative design principles and themes of spatial reorganization that encompass

**05 Abaco di Aule**

Tipo 5 (49,14m<sup>2</sup>)  
Aula 6.30x7.80m, corridoio 3.10m

SCUOLA PRIMARIA  
ICS Giovanni Pascoli: Pascoli  
Via Rasori 19

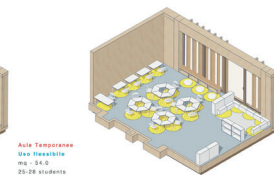
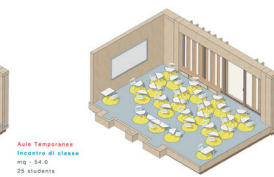
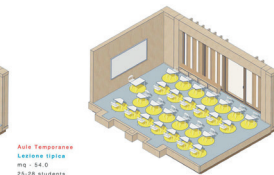
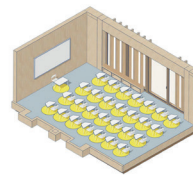
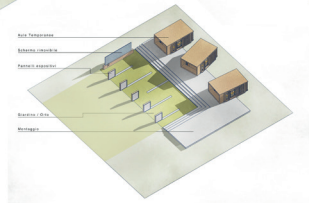
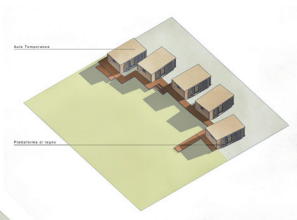
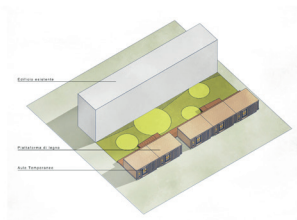
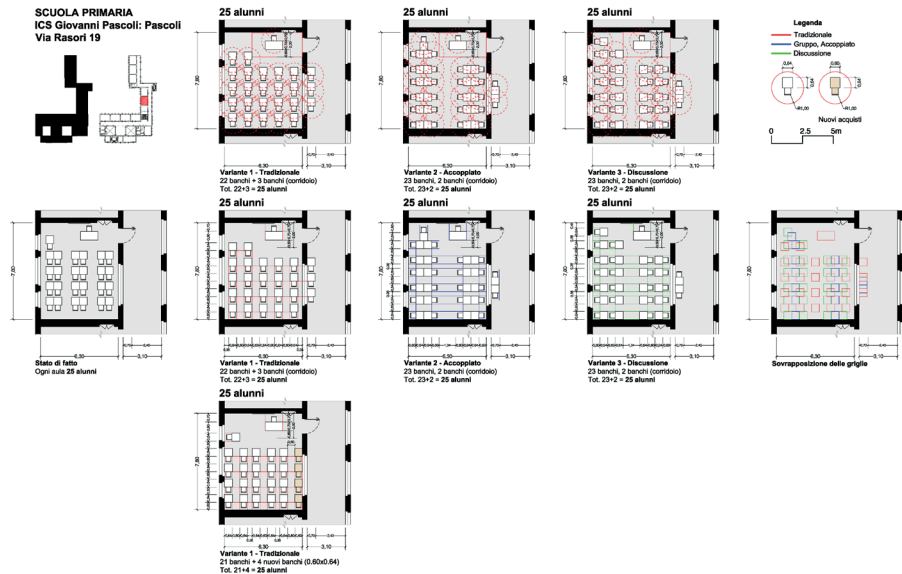
**Fig. 4-5**

Plate from the “Abacus of Classrooms and Types” and study for a wooden prefabricated classroom unit, Cantiere Spazi, UNLOCK Milano, 2020

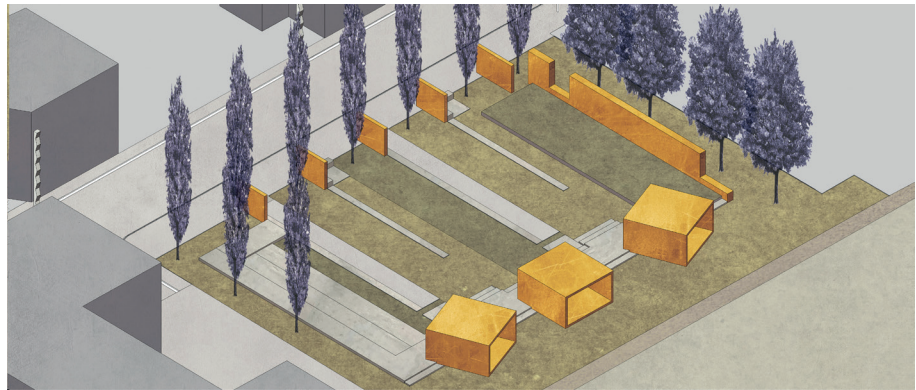
adaptive strategies, the resilience to future pandemics included as a design challenge for space and wellbeing as proposed in the Manifesto of our Osservatorio Scuole (O.S. 2020).

In fact, a key issue for both reopening and future renovations or designs, is that Health in buildings is not only safety but also physical, mental and social wellbeing. In a resilient and healthy city (Health City Institute 2020) all factors that promote the wellbeing of people in education places should start to be seen as inseparable components.

In the present, the pandemic alarm has interrupted the arduous process of innovative teaching in poorly responsive school structures. Within the Table “Unlock Milano”, the OS has elaborated for the Municipality the “Abaco di Aule e Tipologie” to guarantee restart and address physical distancing in terms that are not merely mechanically functional but that allows for innovative teaching in safety and wellbeing.

**Fig. 6**

L. Pezzetti, Design for open-air classrooms, 1st prize, Cesano Maderno, 2015

**Fig. 7**

L. Pezzetti, Design for an innovative school at Monreale, 2016



In the next Phase 3, new requalification strategies, grafting, and types should be explored. Rather than adopting standardised models, learning architecture and active education may learn from ateliers and museums to arrange multiple *space-places*, each tasked with proposing as many possible centres of attention and stimulating aesthetic qualities, as well as allowing for innovative teaching addressed to small teaching groups. The *home base* classroom should be enlarged to allow both distancing and multiple settings. People flows should be separated through architectural means, by reinventing communal spaces. In association with informal learning spaces and workspaces, classrooms can form a continuous fabric that has the complexity of a small city and landscape, being characterised by different depths of field and heights; degrees of partition and sharing; rooms, habitable recesses, *squares* or multifunctional theatres; shaded patios, ramps, paths and gardens. Learners could then experience architectural space in its full richness of space-places, meanings and symbols, metaphors and metonymies attributed to forms; in the play of different scales, heights and layouts, which predispose and stimulate different kinds of behaviour; and in the expression of tactile and aesthetic-perceptive values (Pezzetti 2019).

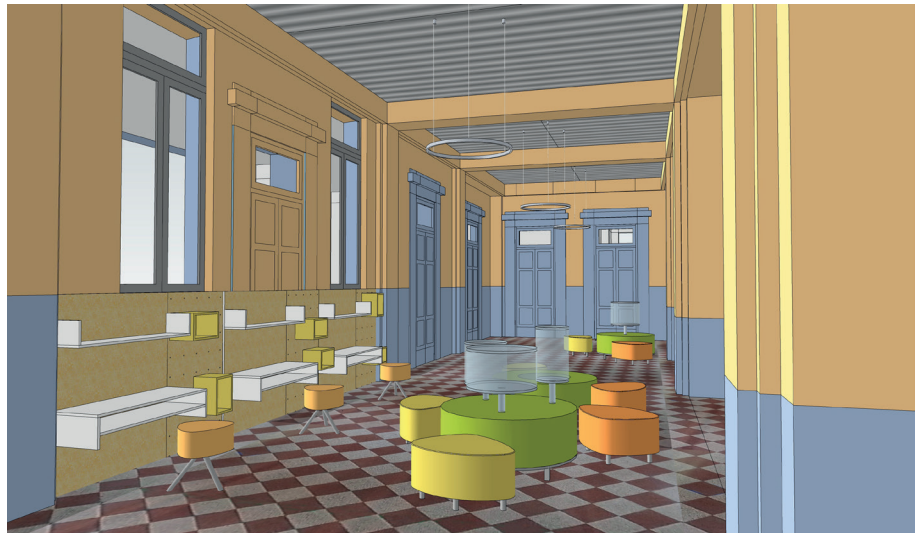
In addition, the history of European cities features qualities that have been forgotten but which are instead crucial for both a new school's ontology and urban resilience: a degree of integration of multiple activities as an inherent character of learning places since the ancient Gymnasium; a civic dimension as a main resource around which society concentrates; and the experience of 'en plein air' schools. Their exploration offers new insights to set guidelines and identify new design themes.

We can learn, for instance, from the aforementioned Greek-Roman Gymnasium, the integration of multiple activities in a dynamic relationship



**Fig. 8**

L. Pezzetti, H. Khanamyrian and Q. Liu, Design for an “Atelier delle Scoperte” in Ruffini Primary School for expanding learning beyond classrooms, Milan, 2020



between the introvert peristyle and its opening to the whole city. The schools of today, in fact, should constitute again the beating heart of districts while providing a number of community functions and becoming hubs for lifelong learning connected with urban resources fifteen minutes walking. The school as a *community centre*, nonetheless, is a subject already emphasized by the Italian experience related to typological criticism (Tafuri 1968), namely in the projects by Aymonino at Pesaro and Canella in the Milanese *hinterland*.

The pandemic has also brought out the importance of outdoor spaces, which have been forgotten by contemporary pedagogy. Open-air education, instead, has a rich architectural tradition in the ‘open-air schools’ of the 1920s-30s and even before in Milan’s Rinnovata Pizzigoni (1911). They feature several issues that the pandemic calls for reconsideration: outdoor classrooms, equipped open air spaces, foldable and openable facades, and an active use of flat roofs. The author’s design for multifunctional open-air classrooms (2014) could be seen as an early prototype to extend safe and versatile teaching spaces into the districts’ parks.<sup>4</sup>

Finally, urban paths and spaces in front of schools, which nowadays have no character, should become car-free areas and a major subject for both flows control and renovating urban space. The experience of Aldo van Eyck’s playgrounds suggests new investigation of prototypical elements to be applied in site-specific urban designs strategies for new socialising spaces.

In conclusion, the constraints caused by the pandemic emergency may constitute an accelerating factor for an organic process of renewal of educational buildings jointly with their urban role, pushing towards new spatial configurations, grafting and expansion of the school into healthy and resilient districts while bringing new urban life inside schools. The collaborations launched with Milan Municipality and Provincia di Monza e Brianza will provide a testing ground towards a “new extraordinary”.<sup>5</sup>

## Notes

<sup>1</sup> “Adozione del Documento per la pianificazione delle attività scolastiche, educative e formative in tutte le Istituzioni del Sistema nazionale di Istruzione per l’anno scolastico 2020/2020”, Decreto N. 39, 26 giugno 2020.

<sup>2</sup> The Osservatorio Scuole (OS) is a think tank of ABC Department, coordinated by Laura A. Pezzetti that has worked on the “Cantiere Spazi – Scuole” to enable Milan’s reopening of school buildings after the pandemic in the framework of “UNLOCK Milano”, a collaboration between Milan Municipality and Politecnico di Milano.

<sup>3</sup> Learning spaces such as the ones promoted by the “Future Classroom Labs” by European Schoolnet are in fact substantially devoid of formal and architectural connotations, focusing solely on functional flexible aggregation of environments, modular furnishing and introduction of 2.0-3.0 equipment.

<sup>4</sup> Il progetto di Laura Pezzetti è parte della proposta a scala urbana per il concorso “Riqualificazione dell’asse Conciliazione-Cozzi a Cesano Maderno”, 2015, 1° premio.

<sup>5</sup> Accordo per il progetto di riqualificazione del campo scolastico di Vimercate nell’ambito del “Programma Re-Start” della Provincia di Monza e Brianza.

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Helen Khanamiryan (1992), M. Arch, graduated with full marks from the Politecnico di Milano in 2019 with a design thesis on the theme of redefining the city limit. She received an award for the project of a site-museum and archaeological park for Han Bridge N.1, developed in the "Heritage-Led Design Workshop" in Xi'an. She collaborates in research and design activities at the Politecnico di Milano, focused on urban form and cultural buildings (schools and museums) in Italy and China. In collaboration with Prof. LA Pezzetti and as part of the ABC Schools Observatory, he collaborated with the "Cantiere Spazi" for the reopening of the post-Covid19 Milanese schools and, currently, for the innovation of two schools and the regeneration of the School Campus in Vimercate (MB).