MIAW 2022

Re-inventing schools

Politecnico Di Milano

School of Architecture Urban Planning
Construction Engineering

LetteraVentidue

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SCUOLA DI ARCHITETTURA URBANISTICA
INGEGNERIA DELLE COSTRUZIONI

MIAW

The MIAW-Milan International Architecture Workshop is the international intensive programme at the Politecnico di Milano, School of Architecture Urban Planning Construction Engineering, that provides an international design forum for schools, teachers and students, but it is also an informal platform to discuss issues and share ambitions that education implies. Its aim is to stimulate cross-over thinking between researches and practitioners in the design field, involving different scales and encouraging an interdisciplinary approach towards design problems. Each class has an international guest professor of high profile whose activity and interests are related to the different study courses and disciplinary areas characterising our School.

MIAW 2022 / Re-inventing schools

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01. INTRODUCTION

Andrea Campioli

Dean of the School of Architecture Urban Planning Construction Engineering

The 2022 edition of the Milan International Architecture Workshop (MIAW) is focused on the topic "school", as integral part of a broader educational project called Inventing Schools, outcome of a fruitful collaboration between the School of Architecture Urban Planning Construction Engineering and the Municipality of Milan.

Likewise past editions, even the 2022 edition of the Milan International Architecture Workshop provided an opportunity for students of our School to discuss a challenging topic, through an intensive teaching method, within a broad and culturally multifaceted training context represented by the visiting professors in charge of the workshops. In this respect, I would like to offer some brief remarks on the following three aspects: the key topic, the teaching method and the training context.

The key topic brought to the attention of the students and teachers who animated the teaching was "the school". The central and strategic role that "the school" has in the development potential of a country is widely recognized. Yet, this awareness has rarely been matched by adequate design effort, neither concerning the updating of training and pedagogical models, constantly stressed by the continuous acceleration of the societal transformative dynamics, nor concerning the regeneration of the existing building stock (over 42,000 school facilities that host around 8 million students in our country), low resilient to processes of functional obsolescence and often with a lack of the most basic maintenance operations. In view of this, there is a gap to be filled both in terms of theoretical reflection and design experimentation. This is the framework in which the MIAW 2022 experience takes place.

The didactic activity of the workshops follows an intensive organization involving students, teachers and tutors for eleven consecutive working days, entirely devoted to deepening the topics investigated for the project. This method differs radically from the way, typical of our School, of developing

project teaching over the time frame of semester. Moreover, it presents relevant specificities that enrich the students training. First of all, it offers the opportunity to focus on the specific topic and to abolish the boundaries between theoretical study and design experimentation: during the workshops reading, studying, teaching, researching and designing occur all at the same time and in the same place. Secondly, it allows direct and continuous interactions between teacher and student and between student and student, building inside the workshop a community without barriers between teachers and students, triggering particularly virtuous learning mechanisms.

Finally, the MIAW training context is distinguished by different cultures, different experiences and different design approaches, put in place by the articulated team of visiting professors invited to lead the workshops: Giancarlo Mazzanti from Bogotà, Karin Hofert from Barcelona, Mladen Jadric from Vienna, Elsa Prochazka, from Vienna, Mia Roth-Čerina from Zagreb. Their intense teaching activity offered at an international level, their professional commitment in very different contexts and their different research traditions have enabled to investigate the theme of "the school" from several points of view, enriching the cultural and cognitive background of the participating students.

Special thanks to the colleagues who coordinated this MIAW edition, to the visiting professors and tutors who passionately animated the workshop and the students who welcomed with enthusiasm the challenge, achieving noticeable results documented in this publication.

Arrigo Arrighetti, *Scuola materna di via Pier Capponi*, Milano, 1953

02. CONTRIBUTIONS

Re-inventing schools. The school as a design opportunity

Camillo Magni
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The 2022 edition of the Milan International Architecture Workshop (MIAW), which I coordinated together with my colleague Giulia Setti, also thanks to the contribution of Corinna Del Bianco for the publication and to the entire steering committee, focused on the theme of schools. Today this theme plays a priority role in the political agendas of municipalities, regions and nations. The reasons behind this importance can be traced back to multiple factors, of which one is of greatest interest for us as architects: how to design a contemporary school, suited for new uses and new forms of teaching. Certain design questions, though brandished by the faction of those who pursue innovation at all costs, have deep roots in the architectural discipline. Others address the matter of how a school can respond to requirements and behaviors that were unheard of until quite recently (just consider the role of technologies in educational programs).

These thoughts led to the choice of the title "Re-inventing schools," in which the term "inventing" underlines the need to rethink the traditional school, while the prefix "re" expresses the reiteration of this action, demonstrating that the school has always been invented, particularly during the era of Modernism.

In this essay I will attempt reasoning on certain design themes that set the character of the architecture of education facilities. Many others will be more fully addressed and described in greater depth in the six essays to follow. I will carry out this exploration starting with several personal experiences. In recent years I have fortunately had the chance to design schools in various contexts: in a professional ambit through the architecture studio I coordinate (Operastudio), which has been involved in the creation of various schools as a result of victories in design competitions. This has allowed us to develop a fertile discussion

with municipal authorities and education departments of various Italian cities and towns. Furthermore, I have had the opportunity to build new schools in programs of international cooperation in Cambodia, Mozambique and Senegal, in collaboration with local non-governmental organizations, international agencies and the most disadvantaged local communities. Finally, in an academic context – through the design workshops of the Milan Polytechnic and intensive workshops like the experience of the MIAW – I have accompanied hundreds of students in their research on architectural composition oriented towards the design of schools.

These experiences have made it possible to observe the same architectural problem from different perspectives. A very wide variety of players and conditions have pointed to the same problems and the same opportunities. In the following essay, I will attempt to survey some recurring themes, leading in the end to reflections of a more ideological and institutional character on the symbolic and civil value of the construction of a school building.

School and city

In Milan, when the Beruto Plan (first, in 1884) and the Pavia-Masera Plan (second) indicated the form of urban expansion of the city through an orderly sequence of blocks, school buildings became one of the tools through which the plan took form. Blocks from the 19th and 20th centuries containing scholastic complexes of forceful urban value reinforced the expansion of the city, giving it form. In this episode, which can be compared to similar ones in many Italian and European cities, the value of the relationship between the school and the city returns to view. The school contributes to construct the urban identity; it builds the facets that strengthen urban morphological characteristics. While this is true of the past, today the school takes on a second role in the contemporary city: it is the symbol of a new way of interpreting spaces for the community. The school is not just the place in which students can learn; it has become a new "civic center," a space where inhabitants can gather and interact. From a functional standpoint, today the school has a more complex organizational system: it is a structure open during various hours of the day, which attracts various segments

of the population, offering its spaces (particularly the library, the gymnasium, the auditorium) to the entire population. In this sense, its spatial character also takes on a different value: these are no longer introverted buildings, functionally conceived for the scholastic community, but spaces open to the neighborhood. The parts most impacted by this new functional role are the entrance to the school, which is transformed into a new public plaza, and the school buildings themselves, which set out to achieve insertion within the existing constructed fabric.

Moreover, from a symbolic viewpoint the school represents the presence of the State in the territory. Regarding this aspect, we can examine many experiences carried out in the countries of the Global South: in these places, scarcity of resources leads to a lack of civic structures, shaping the construction of cities. In many cases urban settlements spread in spite of the lack of roads, public spaces, infrastructures and services. They grow due to the disruptive force of informal pressures driven by a burgeoning population that exists in conditions of great hardship. In this context, the school building is much more than a place of education; it represents the role of the State, the symbol of the community in which it stands. Though with less visibility, but with equal force, this condition can also be observed in European cities, where schools have been transformed in their uses and forms into new civic centers of neighborhoods.

School and typology

Architecture for schools has a strong relationship with typological aspects, mainly stemming from three elements: the repetition of the classroom, the organization of the circulation system, and the relationship of aggregation of the volumes with respect to the open space in which they are inserted, with recurring use of the figure of the courtyard. These aspects have set the tone of the design of schools ever since this function rose to prominence in the modern city, drawing on a sizeable number of much earlier references (the cloister, the temple, the hall), which we will not discuss in this essay. The infinite possible variations of form reiterate the permanence of these architectural figures. Anyone who approaches the design of school buildings in different contexts and with various

sizes and programs can realize the importance of this typological inertia, in spite of the many possible variations. To clarify this aspect, it might be useful to look back on some excerpts from the text by Carlos Martí Arís *Variations of Identity: The Type in Architecture*"[1] from 1994:

"It is often said that typological analysis, though it provides fundamental keys for knowledge of traditional architecture, is not suited to an understanding of the procedures on which modern architecture is based, and is thus a tool of little efficacy for those who approach the problem of design today. Nevertheless, we are convinced that the particularity of typological thinking is the ability to establish an active relationship with the architecture of the past, which goes beyond pure admiration and allows us to grasp its timeliness today.

So what is the relationship that should be established with the architecture of the past? How can we utilize historical knowledge in the field of design? We believe the answer can be found in the notion of the type as it has been developed in modern culture. This implies subjecting the historical material to a radical process of abstraction, through which it is possible to identify its general and permanent characteristics. In this way, the historical material no longer presents itself as a collection of conclusive and inert works, immobile in their condition as fulfilled events, but takes on –freed of this enchantment– a new capacity for interaction. History thus becomes pure potential, and design becomes its particular interpretation in the present.

The typological approach allows us to get beyond the sterile alternative that forces us to overlook historical experience or to imitate it in a mechanical way. Suggesting a structural comprehension of phenomena stripped of their particular and contingent qualities, it opens the gates of history to the action of analogic thinking, thus converting it into a vast territory of references to nourish the design. As a solution to a specific problem, the project thus consists in the manipulation and transformation of this system of references that constitutes the basic material of architecture".

The words of Carlos Martí Arís help us to understand how the notion of the type has contributed to the design of schools. Delving into the spatial aspects,

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1 Carlos Martí Arís "Le variazioni dell'identità. Il tipo in architettura", CittàStudi Edizioni, Torino, 1994. Text taken from chapter "La nozione di tipo nell'architettura moderna", pagg. 166-177.

the repetition of the classroom sets the character of the interiors, with respect (for example) to the choice of using a double or single volume (a central corridor with classrooms on both sides, or a lateral corridor with classrooms on one side only), along with the stylistic identity of the elevations, through the reiteration of a façade division established by the classroom windows. Furthermore, the open space set aside for play and training of the students is integrated with the school through multiple configurations of courtyards that determine the orientation of the elevations, the system of accessways and the layout. The geometric forms of the many possible courtyards do not undermine the recognizability of this figure that has had such importance in the characterization of the school typology.

Finally, the relationship between structure and typology is of great interest. It is expressed in the interface of form, structure and type. Delving into this aspect, we can identify the array of classrooms as the place in which this relationship emerges most clearly. The dimensioning of the classroom and its repetition, in fact, set the structural pace of beams and pillars, which in turn have an impact on the compositional figure of the building. These are elements closely connected inside the project, which again demonstrate the importance of typological investigation as a tool of composition in the construction of the school, over and above the architectural appearance of the façade.

School, architecture and pedagogy

Another aspect has to do with the relationship between spaces for education and forms of teaching. The character of the spaces has a profound impact on the use of the space itself and on the more emotional aspects of the people that inhabit it. This relationship, fully investigated by various disciplines, and which I will not address in greater depth, is particularly important in the design of an education facility where the spaces are earmarked for teaching and learning. An ulterior relationship is generated in these places: architecture, influencing the behaviors and emotional states of its users (students and teachers), also has an impact on the pedagogical processes of the school. The methods and forms of teaching manifested in a certain location resonate in the architectural characteristics of the place itself. Obviously this is a complex and sophisticated relationship,

which defies any schematic formulation based on principles of cause and effect. Nevertheless, and more generally, to hypothesize – for example – flexible spaces for easy modification can encourage experimentation with innovative teaching methods, expanding beyond the tradition of the lecture hall. Likewise, imagining more intimate, private spaces permits experimentation with moments of study involving individuals or small groups, as a way of supplementing more collective activities. Other examples have to do with the character of circulation spaces, designed not only to permit the movement of people, but also to incorporate areas of encounter and recreation, transforming the corridor into a place for learning and play. Finally, we should consider the aspects of perception: light and materials play a fundamental role in determining the quality of scholastic spaces, not only in terms of parameters of aeration and lighting (pertaining to regulations and functional efficacy), but also in qualitative and phenomenological terms. A large, well-lighted and comfortable space creates the ideal context for practice of educational activities. In this sense the Italian standards reveal critical drawbacks, still based on the stipulations of the ministerial decree of 1975: the size of the classrooms, for example, cannot easily be expanded, nor can the height of the ceilings be altered. These are constraints that limit design opportunities and prevent comparison between Italian education facilities and those from across the Alps.[2] Nevertheless, within the rigid regulatory parameters, the project can investigate the most appropriate ways to offer spaces well-suited to teaching and learning. Materials contribute to convey an image of places complying with the character to be formulated, oriented within two extremes we can indicate as an institutional, solemn part, on the one hand, and a more informal, domestic part on the other. Within these variations, we can recognize the relationship between architecture, character and pedagogical uses of the school.

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2 In Switzerland, for example, a middle school classroom accommodating 25 students has an area of 80 square meters, while in Italy the regulations indicate 45 square meters. Inside this reduced surface area, it is more complicated to experiment with different aggregations of desks or to include special spaces.

A conclusion of ideological value: the school and the Italian constitution

To conclude these considerations, I would like to share one further reflection that has a forcefully ideological and partially rhetorical character. In recent months (2022-2023) the competition "*scuola futura*" has been in progress, through which the governments sets out to create 212 new schools in Italy, thanks to the enormous economic resources made available by the NRRP (National Recover and Resilience Plan). This is a political program of extraordinary interest and exceptional ambitions, probably one of the largest works implemented by the Italian Republic since World War II, not in terms of size but in terms of capillary reach. A political program whose force and spread resemble those of past initiatives like the INA-Casa Plan, or the Gescal Plan. In the present context I will not discuss the limits that are emerging on multiple sides, or the enormous lack of preparation on the part of politicians regarding these issues. I prefer to consider the opportunities offered by this situation, in the hope that the new projects will be able to sustain a radical update of the regulatory tools that govern architecture for education in Italy (first of all, the Ministerial Decree of 18 December 1975), which hinder any form of innovation and fossilize educational facilities inside parameters of almost 50 years ago, which are no longer capable of representing the needs and purposes of contemporary society. The school, in fact, is the image of a society. And more: it represents the heart of the community that inhabits it, and it is the organ with which a country is constructed. We are reminded of this fact by the words of Piero Calamandrei (1889-1956), founding father, anti-fascist politician and founder of the Action Party.

The words of Piero Calamandrei, one of the "fathers" of the Italian Constitution, come from the speech he delivered at the 3rd Congress of the Association for the Defense of the National school system in 1950 in Rome. The full text can be found in the book by Calamandrei, *Per la scuola*, published by Sellerio, Palermo 2008, with a useful introduction by Tullio De Mauro. This text was also republished in the magazine *Casabella*, issue no. 786 in 2010[3] to attest to the connection between critical political thought and ways of imagining how we can build the architecture it represents.

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3 Piero Calamandrei, La scuola e la Costruzione in Casabella n. 786, pp 2-5.

Calamandrei's words remind us, though 70 years have passed since they were uttered, of certain points or values that should not be forgotten by those who are granted a political mandate to govern. The fact that these words were read once again at the end of 2009, at the start of the academic year at one of the most prestigious Italian universities, that of Bologna, is an example of how they are still relevant today.

"*The school, as I see it, is a "constitutional" organ. It has its position, its importance at the center of that complex of organs that form the Constitution. As you know (all of you have read the Constitution), the second part of the Constitution, the one entitled "the organization of the state", describes those organs through which the will of the people is expressed. Those organs through which policy is transformed into law, the vital and healthy struggles of politics are transformed into laws. Now, when it occurs to you to wonder what are those constitutional organs, the answer will come naturally to you: they are the Chambers, the Chamber of Deputies, the Senate, the President of the Republic, the judiciary: but it will not occur to you to also consider the school as one of these organs, though instead it is a vital organ of democracy as we conceive of it. Were we to make a comparison between a constitutional organism and the human organism, we might say that the school corresponds to those organs that in the human organism have the function of creating blood. The hematopoietic organs, those from which the blood departs that renews all the other organs every day, that brings them, heartbeat by heartbeat, new life.*

The school, the central organ of democracy, is central because it resolves what we feel is the central problem of democracy: the training of its leaders. The training of its leaders, not just in terms of the political ranks, those who sit in parliament and discuss and talk (and maybe shout), in the upper echelons of precisely political organisms, but also in terms of leadership in the cultural and technical sense: those who head offices and companies, who teach, who write, artists, professionals, poets. This is the problem of democracy, the creation of this class of leaders, which should not be a hereditary, closed caste, an oligarchy, a church, a clergy, an order. No. In our idea of democracy, the leadership should be open and always renewed by the upward flow of the best elements from all the classes, all the categories. Every class, every category should have the possibility to send its best members upward, so that each of them can temporarily, transitionally, for that short instant of life fate grants to each of us, contribute to bring

his work, his best personal qualities, to the progress of society. This can only be done by the school, which is the necessary complement to universal suffrage. The school, which has precisely this character in the loftiest political sense, because it can help to choose, it alone can help to create the persons worthy of being chosen, that emerge from all the levels of society.

This image, you see, is consecrated in an article of the Constitution. It is article 34, which says: "The school is open to all. Capable and worthy students, even if they are without financial means, have a right to reach the highest levels in their studies". This is the most important article of our Constitution. It is necessary to realize the political and social value of this article. Seminarium rei publicae, said the Romans about marriage. We can say it about school: seminarium rei publicae: the school develops the best for continuous, constant renewal of the class of leaders. Now, if this is the constitutional function of the school in our republic, we may ask: how is this tool constructed? What are its fundamental principles? First of all, it is a state school. The state must build its schools. First of all, public school. Public school is the prius, private school the posterius. To have a good private school, the state school should be excellent. You see, we must first of all put the accent on that passage of article 33 of the Constitution, which says: "The republic dictates the general standards of education and establishes state schools for all the orders and levels".

The state school, the democratic school, is a school that has a unified character, the school of everyone; it creates citizens, and it is the expression of another article of the Constitution, article 3: "All citizens have equal social status and are equal before the law, without regard to their sex, race, language, religion, political opinions, and personal or social conditions". And article 51: "All citizens are eligible for public office and for elective positions under equal conditions, according to the rules established by law". The state school must be the instrument to achieve the goals of these two articles, this civic equality, this respect for the freedom of all creeds and all opinions."

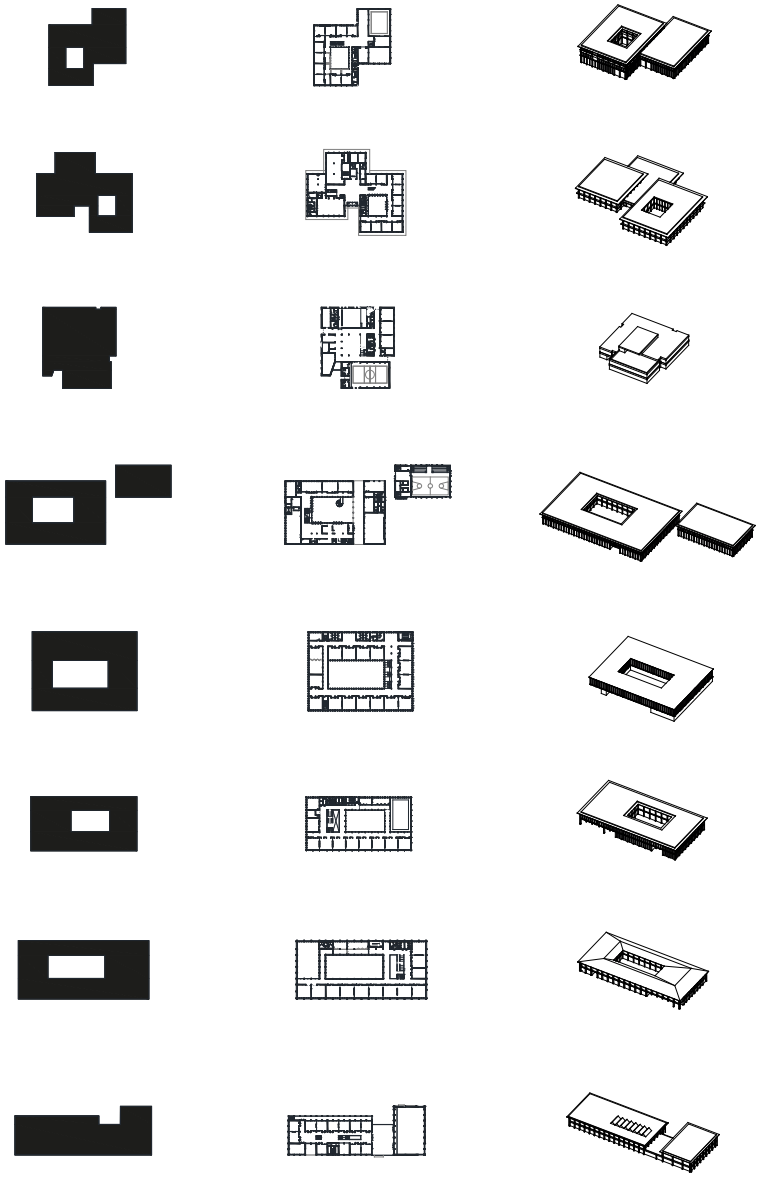
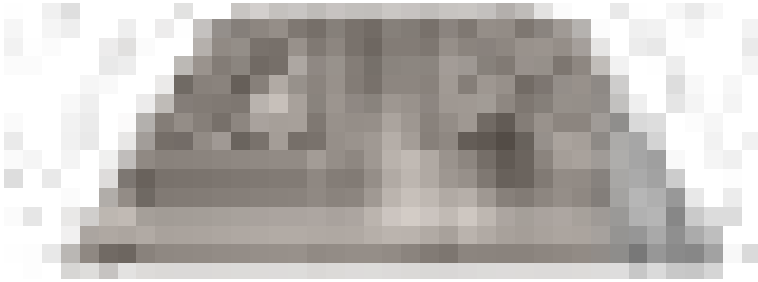


Fig.1. Study on typological variation for the proposed eight secondary schools. *Scuola Futura* project by Camillo Magni (Operastudio)



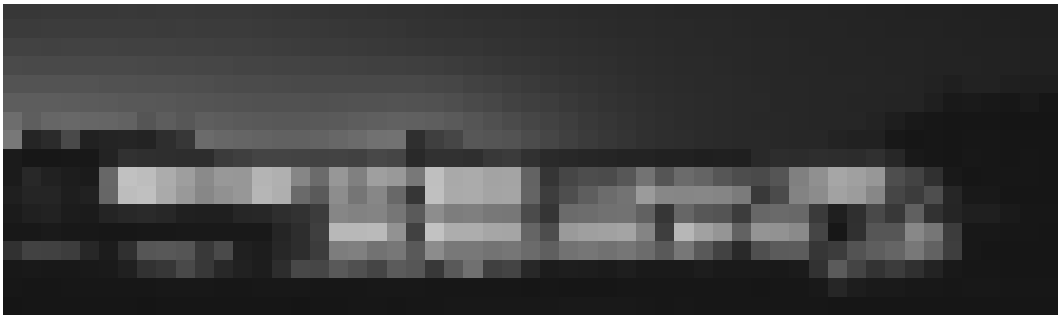


Fig.2, fig.3 and fig.4. Didactic exercise. Architectural Design Studio 3, Politecnico di Milano. *A New school in Milan*. Students: Philip Alexander Valkov, Viktoria Bozukova, Celine Spelzen

Fig.5 and fig.6. Didactic exercise. Architectural Design Studio 3, Politecnico di Milano. *A New school in Milan*. Students: Jiarui Cheng, Hannah Pielow

Let's do school, let's make room!

Operational reflections on the relationship between architecture and pedagogy

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Francesca Belloni - On the occasion of the MIAW - *Milan International Architecture Workshop* 2022 edition, focused on the design of new schools in Milan, starting from the already developed research program *Inventing Schools*, it seems possible to go back to operational and at the same time theoretical considerations. And in the meanwhile, we will take the opportunity to dialogue with Pietro Vitali, head of the research unit of SUPSI "Spazi dell'amministrazione cantonale e della scuola nel Canton Ticino". This recent study on the organization of the spaces of middle and high schools of the Canton of Ticino (Carpinelli and Vitali 2020) provides an engaging starting point for a reasoning that, starting from the topicality of the many issues related to the world of school, will put the role of architecture and its specificities back to the spotlight in the current debate. The attempt to draw lines of trends at the supranational level aims to identify some constants - if one can speak of constants - which, beyond the specific local conditions, characterize the design of school buildings within the contemporary debate.

Although it is difficult to draw up a list, one could first of all start from the relationship between architecture and pedagogy which, from the Modern Movement onwards, has represented an important element for the development of both disciplines. We cannot forget how, between the Nineteenth and Twentieth centuries, the most important pedagogues – from Pestalozzi to Steiner, from Montessori to Freinet, just to name some of the best known, felt the need to measure their educational impact with spatial effects, demonstrating, often referring to specific models, how the articulation of space is the main tool to translate innovative and radical visions into educational practices. The

story of the *glass-walled classroom* presented by Maria Montessori in 1915 at the Panama Pacific International Exposition in San Francisco stands out as exemplary. Counting on the collaboration of one of her best students, the educator Helen Parkhurst, and designer Louise Brigham, Montessori stages the educational show, translating in spatial terms the learning environment shaped according to a clear educational model and shows its potential to the public. For four months, thirty children without prior experience at school, aged between two and a half and six, attend the *glass-walled classroom* inside the Palace of Education and Social Economy; it was a rather unusual event, but it showed how indistinguishable is the relationship between space and the activities taking place in it.

Starting from this striking experience and reflecting in terms of relationships and precedencies on the relationship between pedagogy and architecture, it remains however to wonder how this process is one or two-way, in which direction it may take place, how much the two realities feed each other or how instead the visionary contribution of architecture affects the project with abstract instances from a spatial point of view, or, vice versa, it is the pedagogy to provide models immediately translatable in specific spatial configurations.

Pietro Vitali - In fact every reflection on the architecture of schools necessarily refers to the identification of two poles within which it is located. One of these is the pedagogical model that the building translates into spaces and architecture: a kind of theoretical matrix that needs, to be realized, classrooms, corridors, study, teaching spaces, meeting areas, gyms, outdoor areas of study and leisure, etc. Each of these spaces in turn needs special conditions of use that involve the adoption of solutions and choices of various kinds. Several of these, if not all, belong unequivocally to the world of architecture: proportions and dimensions of the space, contribution of light, materials, colours, thresholds, furnishings. But obviously there is more: the relationship between the functions and activities of the pedagogical model, explicit with schemes and diagrams, is often translated into precise and standardized typological solutions. The typology therefore seems to translate an organizational principle. The other pole is the architecture itself. It is not a tautology: architecture is in fact the indispensable condition of the school and represents the bases on which the practices defining today's

pedagogical models were born and have developed so far. An exemplary case that confirms this vision is what has happened in Italian-speaking Switzerland since the 1950s, in that prolific season of modern architecture in Ticino, which knew in the projects one of the most interesting areas of debate and innovation[1].

The adoption of the principles set out in 1950 by Alfred Roth in his *The new school. Das neue Schulhaus. La nouvelle école* was very important; they refer to the relationship between pedagogy and architecture not in a relationship of dependence, but as two areas that develop and support each other.

In such context the "Schede dell'edilizia scolastica" represented a vital support, consisting in a series of compendiums describing how the various school orders (kindergartens, primary schools, middle schools, and high schools together with sports infrastructure) should be designed. In fact, those cards did actually draw inspiration from the pedagogical principles adopted by the public school, but mainly they resulted from the design experience that had matured and was maturing in those years. As time passed by, the school building cards, while regularly updated according to the developments of the school, and perhaps for this very reason, have ended up becoming increasingly prescriptive and binding, and consequently deprived architecture of its precious role of research and promotion with respect to pedagogical innovation.

When Dolf Schnebli designed the Gymnasium in Locarno in 1959-64, the project sprang out from the analogy between the school and the urban space, this was the idea that founded it and that thus determined its educational space, not only the architectural one. In other words, the origins of that project stem from the sensitivity and the specific skills of the architect. In this regard, it is worth pointing out that this role of architectural design as a research and innovation activity does not only apply to the field of education and school, but also affects and defines the development of other sectors: think, for example, of

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1 Here are some examples:
- Founding case: Alberto Camenzind and Bruno Brocchi, Gymnasium, Bellinzona, 1954-58, was presented at the Milan Triennale in 1960.
- Case in point: Dolf Schnebli, Gymnasium, Locarno, 1959-64.
In addition: Aurelio Galfetti, Flora Ruchat-Roncati, Ivo Trümpy, Primary school, Riva San Vitale, 1961-64; Flora Ruchat-Roncati, Alberto Antorini, Francesco Pozzi, Kindergarten, Chiasso, 1968; Livio Vacchini, Saleggi Primary school, Locarno, 1970; Aurelio Galfetti, Flora Ruchat-Roncati, Ivo Trümpy, Kindergarten, Lugano, 1970.

the world of work, both in industry and in offices, and how the projects by Frank Lloyd Wright and other designers have helped to define the drift. The case of residential building seems to be even more extraordinary, although complex and articulated, as it is apparently an almost exclusive legacy of architects.

FB - Considered within this framework, the relationship between architecture and pedagogy would offer the hook for reading architecture and the process produced through the project not in the sense of a mechanical spatial translation of specific pedagogical instances or certain teaching models, but as moment of construction of the educational process. In fact, if physical space affects the development of skills, the acquisition of knowledge and the strengthening of skills, the specific quality of space, its potential and its characteristics are undoubtedly the result of architectural research. From this point of view, your previous reference to the Gymnasium in Locarno is particularly significant when compared with the project for the Swiss School in Naples. Here Schnebli uses the same spatial element used in Locarno classrooms to give shape to the kindergarten classrooms, obtaining them by way of removal, inside the solid mass of a deeper building. Afterwards, Schnebli himself revealed the origin of this spatial conformation and how it was translated into educational device through the project: «The square plans of the classrooms, the pyramid roof with a central lighting, all came from the sketches of some buildings in Turkey that convinced me for the ventilation fireplaces of the rooms covered with domes and illuminated from the sides. Even the sketches of Iran show the spatial arrangement of equal elements, that is, the chimneys above the domes, which allow the passage of natural light and air circulation» (Schnebli, 2010). Back to the search for some constants, we could underline how in the debate on these issues, the comparison between the two Schnebli projects highlights two areas or rather two different scales of spatial organization. That of the class understood as "children's home" – a concept aligned with Maria Montessori's significant experience, and that of school understood as a small town, in a certain way referring to what was stated by Leon Battista Alberti in *De re aedificatoria* according to which «the city is like some large house and the house in turn like some small city». This interrelation of spatial reference scales is certainly a decisive theme and of significant impact on typological research in the field of schools.

PV - Sharing these analogies between school and village, or between classroom and home, allows to steer for the reflections emerged from the most recent studies on the spaces of middle and high schools in Canton Ticino. The focus has in fact been largely on the study of spaces that can effectively define the intention to give students a place of study respectful of their relationship with society, according to age. Among the most significant solutions and proposals developed and implemented in recent years in this perspective, both architecturally and pedagogically, two spatial models of particular interest emerge: the *classroom* and *the central atrium*. The classroom would be suited for younger children, where the analogy with their home implies a relatively small social context: a group of children who find themselves daily in that space of learning, working, playing and socialization, and who begin, thanks to the experience of attending school, to build a social network outside their own family context. The classroom as a reference space is particularly suitable for primary school children; this is still true for middle school children, at least until before adolescence. In fact, if the introduction of specialized spaces, such as music classrooms or science laboratories, introduces a first opportunity for mobility within the building, the classroom is still the reference space of the student, the constant to which living at school is ascribed.

As we approach adulthood, however, the social context of children is articulated and progressively widens up to the whole community of the school, a sort of village, which in its public and common spaces allows everyone to realize themselves by living it in more articulated ways. The areas of circulation and connection between the classrooms are no longer corridors, but become real atria of different sizes and characteristics, accordingly and precisely in order to give space to this dynamic, so that such areas are designed and act to accommodate functions and study activities, meeting and entertainment in support of the school itself; they are what we have called *central atria.* The analysis of the different school buildings carried out within the study shows how research and the elaboration of typological and architectural solutions cannot be reduced to the literal application of these models. Quite the opposite is true: the specificity of the project and the space left to the architect in this research is a decisive factor of quality. Based on this premise, a closer look at these two spatial units allows to specify how they can respond to the function that is attributed to them

according to this approach. The classroom is called not only to accommodate a diverse range of activities, with various possibilities to arrange desks, chairs, and furniture in general, but also and above all to each student to inhabit it. Hence not only the different, and already well known, variations on the arrangement of the setting of desks (in front lines, in working islands for larger or smaller groups, in circle or semicircle, etc.), but still areas where each student can leave their material, their works and their personal effects; or even small spaces to seclude themselves. This concept of the classroom leads to several possible declinations: for example, a room consisting of a relatively large room, with between 3 and 4 square metres per pupil, with a rectangular plan and equipped with a movable furniture system. The classroom can also be of smaller dimensions, provided that it allows the flexibility of use described above within itself, and it is combined with additional and subordinate spaces, shared with another class; we think in particular to those shared antechambers designed for the Rødovre elementary school by Arne Jacobsen, or, in more recent times, to those additional rooms arranged between two classrooms in the Engelberg primary school, designed in 2015 by Ursula Hürzeler and Shadi Rahbaran. An interesting middle way between these two variants is found in the school designed by architects Studer Simeon Bettler at Albisriederplatz in Zurich between 2007 and 2009: an L-shaped classroom whose spatial articulation allows to organize activities in a differentiated and tailored way, so as to meet the needs of each student.

Identifying typological categories for the central atrium is more difficult instead. The variations between the solutions already adopted for this space unit range from a more or less generous widening of the corridor that distributes the classrooms and other enclosed spaces of the school, thus generating areas where it is possible to pause, study or have leisure[2], to a wider and freer conception of the plan. A very clear application of this model is the Ørestadt High School, built in Copenhagen in 2009 by the 3XN studio, in which the several closed classrooms of the school are displayed in a large open space. The quality of this typology lies therefore in the architecture and spatial qualities of this large atrium as well as in the type of activity that it is able to accommodate: there are spaces for individual study, socialization spaces, small amphitheatres for formal

2 See Christian Kerez's project for the Leutschenbach school, completed in 2009 in Zurich.

or informal presentations, library areas, dining, rest, leisure areas, infrastructure for work and computer study, small exhibition areas, reception spaces, very open areas and more secluded areas. All of this, in addition to hosting the school's activities, aims to give shape to a varied and stimulating internal landscape.

FB - Starting from the description of the two main elements of the "future" school you have identified – *the classroom* and *the central atrium*, I would take into account some relevant reflections. The first comes from the obvious, but necessary observation that architecture is always built starting from architectures; it is interesting to note that the relationship of mutual dependence between type and social system is expressed by direct references to buildings rather than to schemes or functional diagrams that are without architectural substance, though certainly effective if used to illustrate possible distributive or organizational alternatives. Your study also reaffirms that only through the project a real possibility of experimentation and comparison between different spatial organizations opens up, and that the project cannot be reduced to a literal translation of schemes or norms. Moreover, wanting to look more deeply into the results of your study, it would be useful to point out that, starting from conditions and assumptions in some ways very different, the Italian Indire researchers have moved on similar fields, reaching comparable results. Striving to answer the question: "What is the most effective learning environment for the students of the new millennium?", they have coined the formula "1+4 Learning Spaces for a New Generation of Schools". Accordingly: «"1" stands for the former classroom, now a modern learning environment open to the rest of the school and to the world. "4" stands for the four school's main types of spaces: Agorà, Individual area, Informal area, Exploration Lab»[3]. A completely revised classroom in relation to the traditional structure, in close connection with four complementary fields, spatially diversified, able to accommodate the development of equally differentiated activities. In addition to this, the attempt to reduce or abolish the distribution, at least in the form of the traditional corridor, which is in fact often replaced by a continuous circulation between the

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3 Indire, Re-arranging Learning Environments - The 1+4 manifesto for educational spaces, 2016. https://architetturescolastiche.indire.it/en/progetti/the-14-manifesto-for-educational-spaces/

rooms, according to a spatial reinterpretation in memory of the Vasari runner, which in the Baroque *enfilade* saw its maximum splendour. An example is the Engelberg primary school, which you mentioned yourself, but also the projects by Thomas Fischer Architekt studio for the secondary school in Laufen, which ended in 2021, or for the newly opened Freilager school complex in Zurich-Albisrieden. Here the desire to eliminate any distribution space gives rise to a compact plan organized in matrix, an uninterrupted architectural sequence plan, a spatial flow without apparent hierarchy.

This spatial configuration – which, among other things, is being disseminated in several recent projects – allows us to introduce another issue which apparently relates to a different plan, but which greatly affects the project; I refer, in volumetric terms, to the compactness and, in terms of planimetric and distributive terms, to the relationship between circulation surface, plane surface and useful surface. Considerations regarding these factors are in fact the reasons for the increasing diffusion also of another kind of plan, that of the compact and isolated volume organized around a central distribution nucleus, which at the same time becomes a sort of large collective covered *Hofe*: the proposal for the *Modulare Grundschulen* in Berlin or the project for the *Anna-Freud* school in Berlin by Bruno Fioretti Marquez, as well as the project for four modular primary schools in Munich by Wulf Architekten are examples.

PV - Referring to these issues, the adoption of the *classroom* and the *central atrium* for the great extension of the latter or because of the large area necessary for the construction of the classrooms as described, would seem inevitably lead to an extraordinary consumption of space. However, the surface analysis made by comparing different schools leads to the opposite conclusion. After establishing two key criteria for this analysis, namely the per capita area in class and the per capita area in school, it emerges how the best ratios are measured in those schools which adopt these models. In which an abundant area in the classroom - for the benefit of the student's well-being and learning, and a reduced area of the school as a whole is considered best for the rational use of resources.

In both cases, from an observation of the plans, this relationship must be traced from the architectural and typological point of view to the almost total absence of corridors that these models allow, as you mentioned before. From the

pedagogical and organizational point of view, the possibility of concentrating many activities in the two flexible reference environments – the classroom and the atrium, allow in fact to use all the spaces of the school more rationally and with more profit, which would know more downtime otherwise. The elaboration of this study has also highlighted some secondary factors with respect to the objectives it set itself, but of absolute importance in the more general perspective of school architecture. The first is the extraordinary analogy that connects the recent developments of the school spaces with what is happening in the field of work and more particularly of offices, both in terms of organization and in terms of architecture: the *Bürolandschaft* born in Germany in the 1960s[4], as well as the mobile office proposed by Herman Hertzberger[5], or the so-called Swedish Combi-office[6] from the 1970s, or the latest forms of work organization, such as activity setting, desk sharing, co-working or the a-territorial office – to mention only some of the most significant, seem to converge in the conception of schools.

FB - Your reference to the concept of a-territorial space, that is to the progressive overcoming of the idea of the "own desk" inside the classroom and the "own workstation" in the workplace reminds me of WISE[7], a compelling study conducted by the research section of the Danish study Cebra on the psychological impact of architecture on users. In the name of the provocative slogan "form follows feelings", the WISE Journal (Work Innovation Space Education) inquires how architecture affects human emotions and cognition and «investigates the dynamic relationship between architecture, humans, and human activities in learning and working environments by bringing into conversation different scientific disciplines and some of the world's foremost thinkers». Starting from neurodiversity, through this research Cebra investigates the spatial characteristics of learning and working environments, managing to clarify in some ways the reasons why certain spatial conformations are preferable to others. An undoubtedly useful study when it comes to establishing

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4 Walter Henn, Osram Offices, Munich, 1963.

5 Herman Hertzberger, Centraal Beheer, Apeldoorn, 1970-1973.

6 Tengbom Architects, Canon Headquarters, Stockholm, 1978.

7 WISE by Cebra. https://cebraarchitecture.dk/wise/

the spatial patterns to be used in the project and, through them, to specifying the character of the individual environments. Of course, this again has to do with the distinction we initially mentioned between schemes or diagrams and concrete references to specific buildings, that is to say how studies of this kind can be actively implemented in the design process and what outcomes might be expected.

PV - We could say that the adoption of innovative typological and organizational models finds in some buildings a particularly clear and understandable translation. An example of this is the Ørestadt High School for the model of the central atrium, or the German Hessenwaldschule for the model of schools organized in clusters[8], or the case of Bremer College in Woodend, Australia[9], which faithfully conveys the innovative pedagogical principles of the state of Victoria. In specialized literature we often refer to these and other cases that we have treated and analysed in our study. Bringing our attention back to the intrinsic qualities of architecture and its spaces, recognizing in these qualities one of the central and essential factors of good school, we must also recognize the project and its quality, that irreplaceable role of synthesis not guaranteed by a mere translation of models and types, whatever more or less mechanical or diligent. However, we find ourselves always and again confronted by the call to resort to the project, understood as a tool, as a critical method of analysis and development not only of the practices of types and models, but always and again of architecture and spaces.

FB - To conclude, I would like to draw our attention to what you mention and try to make it explicit through an example. It seems to me that it is always necessary to distinguish between good practice and exemplary projects. Considering the results of your research or that of Indire and comparing them with many of the examples mentioned, the central atrium, on the model of the Ørestadt High School becomes the fulcrum around which the school is recognized and organized, allowing everyone to feel part of the school community according to

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8 Wulf Architekten, Hessenwaldschule, Weiterstadt, 2016.

9 Hayball, Richmond High School, Richmond-Melbourne, 2019

their personal needs and inclinations. A large space that however is not of recent invention, whose ancestors are rather to be found in the tradition of architecture and which refers to the consolidated types, characteristic of collective buildings, in particular of northern Europe. The Aldo Rossi's consideration comes back, with his description «of the great *Lichthof* of the University of Zurich, […] which is always full of students from the ground floor up through the successive levels. And what was undoubtedly a university I saw as a bazaar, teeming with life, as a public building or ancient bath» (Rossi 1981, 8).

This once again seems to be the reason why dealing with school architecture, even for the school of the third millennium; to build a "fixed scene" as much as possible able to adapt to changes - even those unforeseen or unforeseeable, while remaining always the same. In the long term, this is the deepest meaning of sustainability: the capacity of space and its formal interpretation to welcome change, to build a lasting scenario and, to the variation of the surrounding conditions, to represent the cultural and social reference point of a community.

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What about (schools) typology?

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Massimo Ferrari - If we intend to take on the issues of contemporaneity – as we always do in Architecture – as protagonists of a discipline that constantly seeks answers adapted exclusively to present and future – we should opt to re-establish the entire issue of education – from its origins rooted in civil society – because the contemporary interpretation has completely transformed the standardized directions of education, from the roots up. Without intending it, the discussion around the educational revolution has now indirectly undermined the classroom and corridor paradigm that characterised and fixed the architecture of educational institutions for at least 70 years. There has been a rethinking, preparing what amounts to a *clean slate*, returning the cultural debate all the way to the late 19th century, when the radical thinking on education of the very young which arose in Italy, on the part of Maria Montessori, the Agazzi sisters and others, resonated as far as northern Europe and the Americas. Not the least of this of the contemporary situation is the digital transformation, which after 20 years has finally made its true reach felt in the field of education, among others showing the current limits of its uses, considering digital technologies solely in terms as a means of interaction between knowledge and users. In this historical period, accelerated by the pandemic, the disciplines related to education have in fact led a silent protest, which through synaesthetic as well as technological hypotheses have illustrated paths that give reason to the need for a new typological interpretation for the architecture of the educational institution, recognizing the more general characteristics of a composition that can be developed with its own differences and roots. It thus becomes inevitable that we imagine this new relationship between the parts, going beyond the mechanical functioning of corridors and classrooms designed only for frontal teaching, in favour of the search for adequate spaces that assume every place within the school building as a space for learning. This important ambition is

certainly difficult for an international architecture which, although improving slightly, remains too singular in its authorial relationship, seeming to settle for temporary and one-of-a-kind solutions, flaunting them as definitive, precisely because of the quantity of partial and extemporaneous responses, when in reality these capture only a few limited aspects of the overall discourse currently in play in education. Currently, however, this is an approach involving an oblivious formal redemption, of critical-planning attitudes responding to the fragmented offerings proposed by the sum of disciplines dedicated to education. How should we act then? Above all considering that, paraphrasing Abraham Lincoln, the methods, and spaces that a society designs today for the education of the youngest are responsible for the collective consciousness of the society of the future. How can we confront the matter of a revolutionary new typological theme – meaning revolution as rethinking – and not only the compositional theme?

Claudia Tinazzi - This issue of revolution, or rather of a typological rethinking of the sphere of educational architecture, is certainly crucial today, even more so if we think that – especially in Italy – the increasingly necessary and urgent transformation will inevitably encounter the uncomfortable question – interpreting a well-known text by Aldo Rossi – of "What do we do with the old schools?" Obviously, any reflection on this transformation must recognise that the first reasoning on this adjustment of learning spaces will have to – or perhaps already does – involve building cheek to jowl with the existing structures, de facto defined in terms of *classrooms and corridors* and therefore from the more or less valid relations between these two elements, profoundly rooted in the history of educational architecture.

"Continuously and inevitably, the environment formed of small buildings, of old construction – the houses of the past dear to our memory, the colours, the peeling plasters – collapses, alters, changes, becomes something else. […] In this way, cities change without notice" (Rossi, 1968, pp. 41-43).

In the Italian case this constitutive constraint amounts to important numbers: more than 40,000 buildings, about half pre-1970s. But such a constraint could perhaps become a resource, an opportunity to redefine a new relationship between the "educative" parts that make up the school building,

without necessarily resorting to a *slate cleaned* of what proceeded us. Instead, we could search out the qualities that these complex systems have brought into the present day. This would have to be an honest and open-minded search, without prejudice in architecture or education, capable of continuing in the existing stream of values but "without excluding the tears, the more drastically surgical interventions, sometimes necessary in the presence of deeply diseased and cancerous tissues" (Gardella, 1959). Yet, considering the great existing heritage of school architecture, the question to be raised is whether or not "drastically surgical" interventions are truly necessary.

In recent months we've seen news of the planned demolition of the Longarone primary school in the province of Belluno, making way for a new school more suited to contemporary educational reasoning, as part of the "grand" project under the National Recovery and Resilience Plan, called "FUTURA: The School for Italy of Tomorrow".

Designed in 1964 by Costantino Dardi, the "Children of Vajont" school is a tangible asset representing a fortunate era in twentieth-century Italian architecture. Moreover, if we look at it as an "educational building", we cannot help but recognize some persistent and general elements that are worth more than a blind chase after avant-garde educational models, not yet settled in their essential characterising values: from the relationships expressed between interior and exterior, to the privateness established for both school and town, to the classroom spaces vis-a-vis collective spaces. The demolition will make way for a park, and the new school will be built in a different location.

Observing what the contemporary offers to reasoning and development on the theme of educational architecture, this brings us to a crossroads, to a more general issue for our discipline, meaning to the questions surrounding the role of the educational typology and the character of the buildings, beyond the matter of their roles in the city as time continues its inexorable passage.

Francesca Belloni - The role of typology, the characteristics (not only typological) of buildings and existing heritage, were the battle-horses of the 20th century, but are currently out of fashion and absolutely rear-guard. The new battle-horses are innovation and sustainability, and above all green space (even better if public green space), as if these were the panacea to all problems

arising from the current crisis that we are experiencing. The discussion on innovation and sustainability is certainly essential, even more so in Italy, precisely because of the interaction of these matters with the built heritage. In the case of Longarone, we're dealing with author's "heritage". But even in other cases, although often reduced to a question solely of physical consistency, this is a discussion that cannot be ignored, given the numbers of buildings involved. We must recognise that, just as for Costantino Dardi's school, the same fate awaits many more of the total 40,000 buildings. Another meaningful example is that of the kindergarten in via Pier Capponi in Milan, built by Arrigo Arrighetti in 1954, whose architectural description – involving typological, distributive, and constructive choices made following educational principles from fifties – could be taken today again as a model for new realizations. So, there is more. The cost-benefit balance must certainly be considered; but, among the benefits (or rather among the costs) the "intangible heritage" that underlies the immense material heritage with which we are dealing should also be included. Longarone has its own intangible heritage; in Milan, with the schools of Arrighetti, we have another, and so on.

And there is still more. Careful reinterpretation is due, at times on a case-by-case basis, of the architectural qualities of each building – i.e. the urban, typological, spatial and distributive qualities – so as to assess any potential need for "drastically surgical" interventions, and to devise the complex of procedures that will return these buildings to "attractiveness", in every respect, considering also that these are the same buildings that housed yesterday's youth, and so – again paraphrasing Abraham Lincoln – are responsible (whether we like it or not) for the collective consciousness of today's society. Such re-interpretive processes are under way in some countries. An important example is Arne Jacobsen's Munkegaard School, in Gentofte, where a decade ago, Dorte Mandrup Architects carried out an important project of restoration, modernisation and expansion.

We must therefore consider that for educational buildings, the "performative potential" of architecture assumes a twofold meaning: first of all, as "form of the content" and also in terms of the capability of the architectural design, as material heritage, to give rise to educational contents through the spatial conformations that find their constitutive reasons in the architectural research itself. And still

more: referring to Lincoln's quote, since heritage is also immaterial, the building is the bearer of a series of values and meanings that cannot be separated from their physical support.

In this regard, Mario Castoldi, referring to the lesson of Paul Watzlawick, in a recent book dedicated to the learning environment, states: "The way we convey a message is an integral part of the message itself, and indeed is often its most pervasive and incisive dimension […]. In other words, the distinction introduced by the pragmatics of communication between the plane of content and the plane of relations, between what we say and how we say it, as complementary faces of a communicative event, returns: the plane of content refers strictly to the logical-cognitive level of communication, where the plane of relation mainly concerns the socio-emotional level" (Castoldi 2020, 45).

Elvio Manganaro - I would like to return to the typological issue, because it seems to me an important problem. After all, it has only been fairly recently that education developed its own institutional and configurational stability, in what we call the *school*. For centuries, the transmission of knowledge, both manual and abstract, proceeded independently of any specifically designated places or institutions. This is the first point. So, when we talk about "school", we are not talking about training or education tout court, what we are talking about is the "educational institution". We are speaking of the device that in a given era assumes responsibility in the tasks of educating the new generations: the device that today, from many quarters, is referred to as outdated, meaning the device founded, as Massimo Ferrari has noted, on the "classroom-corridor paradigm". This is a device inherited from the late eighteenth century, strictly functional in the logics of accumulation by capitalist enterprise proper to that particular historical era. The hierarchical subdivision into vocational directions, sections, classes, and then rows of desks, was functional to a process of selection and discipline that went as far as the child's body, making the individual docile and obedient, as required for the new labour force. These are matters well investigated by Foucault but deserving of renewed consideration.

Although we may understand that mass education has these origins – sharing its disciplinary tasks also with barracks, hospitals, and prisons – what we fail to understand in the current debate around the new schools is the disengagement of

the schooling device from the economic motivations that structure our societies, and its new ambiguous contortion around the child and their happiness. Are we certain that the educational institution has divested itself of its functions as this former kind of device? And that capital – whose logics have certainly changed since the nineteenth and twentieth centuries, because the relations of production have changed – has truly withdrawn from the education of future generations, leaving the field to the competent and progressive scientific discipline of education, with its heartfelt concern for the growth of the child as adult and citizen? We are speaking here of the same *late capitalism* that currently disdains to even mask its violent pursuit of profit. There is also the problem of immigration, again with effects on the future of children and young people.

One must ask, then, is the greatest evil really school buildings whose configuration is based on the classroom and the corridor? An obsolete configuration, certainly, but obsolete with respect to what? With respect to the happiness of the child, or to the new demands of capital accumulation?

Years ago, Lucio Russo, following the Berlinguer reform, argued that the Italian school would no longer need to operate in the selection and training of technicians for manufacturing work, because increasing automation and delocalisation would drastically reduce the demand for such personnel. Instead, the school would perform tasks of socialisation and consumer education. After all, he said, except for a very small share of hyper-skilled technicians, the majority of citizens would now need more knowledge on the consumption rather than the production side. Today, considering the current role of technological devices and their continuous updating, Berlinguer's analysis seems even more pertinent. Thus, we come to understand the true nature of the current displacement of the classroom-corridor paradigm in favour of fluid, undivided, flexible learning spaces: this is in fact the updating of the device to the new logics of accumulation, with their overlapping boundaries between production and consumption, and the similar blurring of boundaries between public and private. In this context, the rigid distinction between life inside and outside the classroom is no longer functional, just as it also no longer useful to discipline the students to stay in their seats until the end of class.

I say these things not to defend the traditional school, which I have suffered, as I imagine many of us have, but to suggest an approach to the debate on the

new educational institution, from a disciplinary point of view, and also to the problem, which Claudia mentioned, of what to do with the old schools.

In this regard, we must also inquire into the role of the architectural language, or its "formality", if you prefer. Are we really convinced that remedying a certain distributive and configurational obsolescence is more important than the formal characteristics of a building? More valuable than the ability of these characteristics to educate in form itself, in beauty? Is it instead that the formal characteristics of the educational institution must now also contribute to the new narrative? And again, are we so sure that typology and function (in this case function being traditional education) are so intertwined that the planimetric configurations originating under other educational prerogatives cannot accommodate or adapt to new modes of education? Haven't we learned that type and function do not necessarily coincide?

It seems to me, in conclusion, that the case of the demolition of the Dardi school in Longarone to make way for a new more "educationally performing" school, is starkly revealing of the ideological dimension of the debate around new schools, and of the brutality in swiftly and unswervingly pursuing what is now deemed the urgent updating of the "device".

MF - It seems clear then, and very well expounded in this brief discussion, that we achieve prime results in architecture when we retain the lucid ability to reread the precise trajectories of topicality of the specific issue, the succession of reasons that have preceded us and that bring light to the current darkness. What we need is this lucid observation of things, this strong link with the ethical and political development of our discipline that Aldo Rossi addressed in his well-known early writings; writings central to the post-World War II debate, elaborated through exchange with his contemporary architects and then taken up by those who accompanied or followed. What is necessary is a lucid and conscious knowledge of reality; of a reality which in transforming continually indicates the course, the curve to follow, but which we should often aim to correct. A superficial view, on the other hand, will never achieve more than a flash in the pan. While this position is true, the previous speakers have equally made clear that the balance of the discipline lies in the binomial of opposing or equivalent contents, going beyond any extremism, rather seeking consensus

and harmony with its host society. Not a "least common denominator" but a discipline of "discrete fanaticism", achieving clear and sharable recognition by a large part of current society, which in adopting this share as its own can thus continue this richness of contextual stratification. The work that confronts us will ultimately be revealed in the syntheses of words we have heard today: such as "continuity and transformation", raised by Claudia Tinazzi, or "form and content" emphasised by Francesca Belloni, or even the "political and productive" derivation of the primary meaning of education, expounded by Elvio Manganaro. But we can then also include a further reflection on a pair of words less related to the theoretical aspect of architecture but certainly fundamental in the concrete design of the future. These would be the term "typology" as the result and synthesis of what has preceded us, in its permanence and immanence, and "imagination" as the possibility of interpreting the potentialities of the future, through the decisive role of the design, up to its final construction. In this way we will construct a word pair capable perhaps of directing the plan, which is in fact the eternal answer to every theme addressed by architecture, even without arriving at a full definition of that theme. "Typology and Imagination", would not be far from the many words already advanced in defining the path of the project - not coincidentally centred around the Modernist revolution. In their proposed interpretation, they speak of a potential new horizon capable of linking ambitions and the concreteness that is eternally necessary, even in these new times. A kind of Museum of Iconography, as in the conception of André Malraux, and where the deepest founding of educational architecture "like all conversion, involves the breakup of an earlier relationship between the individual and their world".

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Fig.1. Costantino Dardi, *Primary school "Bambini del Vajont"*, Longarone, 1964, view of the public garden at the entrance to the school.

Fig.2. Arrigo Arrighetti, *Kindergarten in via Pier Capponi*, Milano, 1953, view from the garden.

Fig.3. Dorte Mandrup Arkitekter, *Restoration and extension of Arne Jacobsen's Munkegårds School*, Gentofte, Danimarca, 2009, view of the entrance to the school.

The school between education and emancipation

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The word School derives from the Greek *skholê*, which means "leisure" (place where one does not do physical work). The idea of school is, by definition, the place of study and scholarly exchange in which one receives a collective education. Nowadays, the idea of school also refers to a civil role in the architecture-building in contemporary society, where people work hard to eliminate social and economic marginalization.

MIAW 2022 wanted to look not only at the latest of these 'places of study' but at this role and the way of architecture is taught today... involving more and more students, teachers, users, people and all of those who believe in the role of education.

The general question concerning space for instruction seems to intercept a topic of overall interest, given the changing conditions of the layout of buildings and collective public space. It concerns both the obsolescence of the symbolic significance and preminence of unitary themes, recently dominant in the panorama and structure of the traditional city, and a tendency, that is now homologating, that pervades design and scientific research in architecture. Meanwhile, there is an attempt to qualify the design process through the requirements of versatility and flexibility through a controversial principle of function hybridization.

This principle - in adulterating some contents that were part of the physiological functions of the city (such as the house, the town hall, the theatre, the stock exchange, the park, the monument, the museum, the exhibition, the school, the factory, etc.) - grafts certain degrees of figurative sweetening and sometimes linguistic counterfeiting.

The issue around school architecture does not seem to be exempt from this internationalist afflatus. In this particular case, it would seem that recently the role of the school building has been entirely conceived through a rank of the exaltation of its appearance. It is evident, for example, in the association that connotes the form of the building itself with the typical tools of pedagogical work; rather than the naive assumption of a chromatic apparatus that simulates the colourful world of the school, etc. The exterior appearances under this condition may seem entirely defined by an acknowledgement of the fluid system of contemporary society - beyond the pervasive nihilistic culture that involves the city and causes a sort of crisis of identity, as well as, some design attitudes take on relevance, which struggles to distinguish building genres by specific requirements and propensities.

Recently, these attitudes have being showing all the weaknesses of the excessive functional approximation that frequently has been misunderstood by an increasingly claimed typological versatility.

It appears that, for example, many expectations of technological innovation have lately been poured onto the sphere of the school. This idea of the layout pattern is, apparently, assisted by attributes of flexibility and automation, where the requisites of habitability often are professed with the prerogatives of digitisation and connection capable of apparently offering a higher rate of living quality of the educational space. Yet if we want to rediscover certain aptitudes of specific design experiences that have characterised a large part of European architectural culture, the structure for education has also been at the centre of clear experimentations. They were generated to satisfy the real needs of authentic didactical and experimental purposes, throughout effective figurative instances, albeit declined case by case, according to unquestionable aptitudes and taste.

In the early 20th, the Dutch vanguard was dismissing the so-called "internationalist functionalism" in order to promote and strengthen a new approach to architectural space design. With Willem Marinus Dudok (Japelli and Menna 1997) in the "Dr Bavinck" school in Hilary Bavinck at Hilversum in 1921, and subsequently with Johannes Duiker (Molema 1991) in the Amsterdam Open Air School in 1930, a precept of experimental organization of space took place (Fig.1).

This reaction to the conventional attitude was so intense to have innovated in

a more or less classicist way the whole apparatus of the traditional typological forms. In addition, this reaction was allowed to intercept the social and political, productive and constructive changes underway through experimentation of forms, instated to predefine the city and the use of architectural space in its time.

On the other hand, Duiker's typological invention radically overturns the architectural and educational principle implanted in the centrality and compactness of the traditional public building, restored to unconditionally innovative practicability. In the corrosion of the architectural envelope, to mark the need for a continuous relationship between interior and exterior space combination, the whole layout was arranged whit a vertical course.

Innovation and radicality of the architectural organism were also instilled in the innovative principles of Hannes Meyer's Petersschule in Basel in 1927, where the typology of the compact vertical block was counterpointed by a suspended and projecting horizontal plane, a surprising invention to compensate for the lack of free space at height (Fig.2).

The traditional classroom-corridor distribution for the main block was still mismatched by the suspension of the horizontal and vertical connective as cantilevered paths on the façade line. So that the "constructivist" register adopted was produced not to evoke the complacency for technical skillfulness but as a poetic sublimation capable of anticipating an invoked future society.

It has now been ascertained how these innovations really question the needs of the inhabitant, and to see some of the experiences during those years, including the recent experience of forced segregation for pandemic reasons where informal and spontaneous solutions of a more associative and shared spatiality were forcibly re-activated, in a physiological attempt to overcome the ideas of confinement and isolation of the classroom block, it would be worth rethinking how those solutions have authentically interpreted the building of education in its constitutive essence.

It is also about that heroic experience of the Parisian Banlieue that in the same year saw the architects Eugène Beaudouin and Marcel Lods (Barraqué 1987) realise the Ecole de Plein air in Suresnes (1932-36) in the suburb of Paris (Fig.3). At that time, the proposal embodied an ideal prototype of the open-space involvement in the pedagogical ambitions of the contemporary school programme. Further to Richard Neutra's design (Drexler and Hines 1984) for

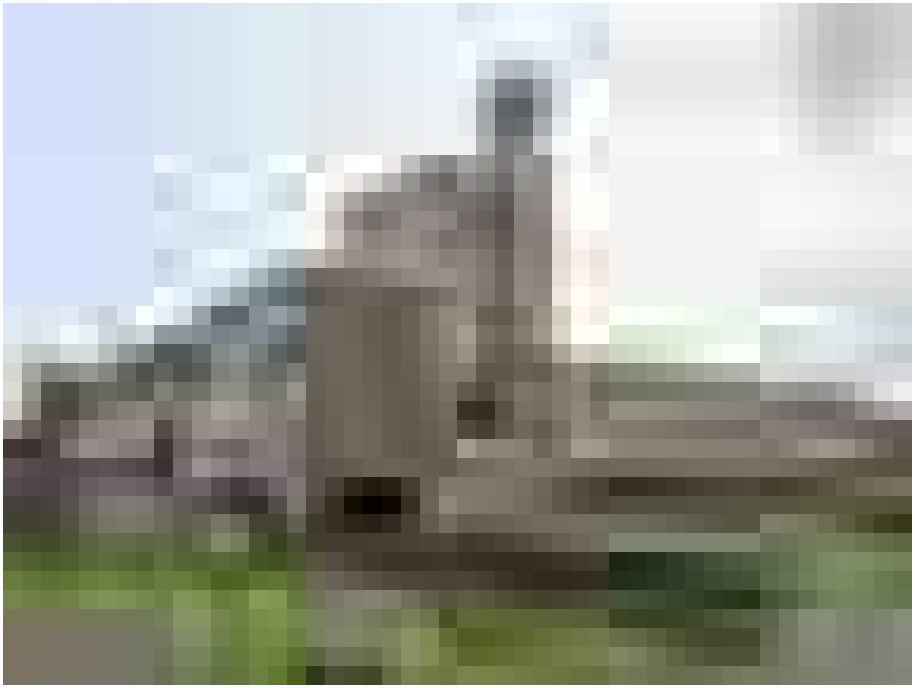

Fig.1. Willem Marinus Dudok, *Dr. Bavinck School*. Hilversum, Holland, Netherlands,1921-22.

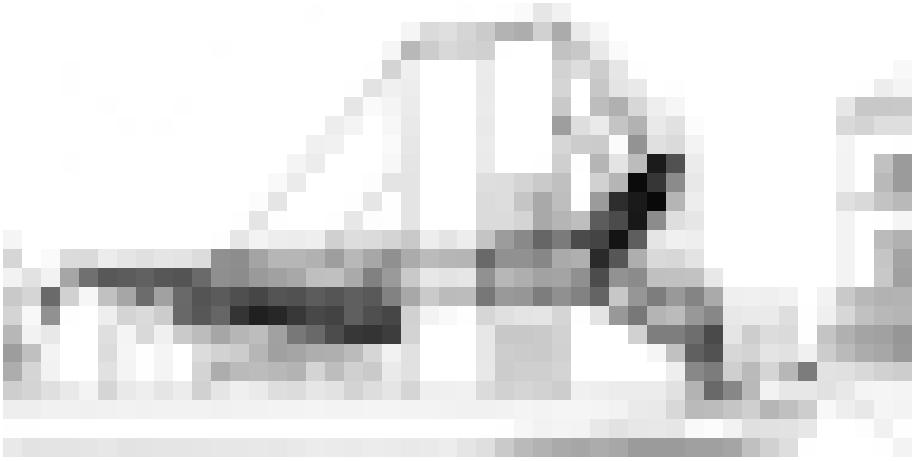

Fig. 2. Hannes Meyer, *Petersschule* in Basel, Switzerland, 1927.

the Ring Plan School in 1926 for the Rush City Reformed, a reliable attempt at emancipating the engagment of nature into the body of architecture (Fig.4).

Therefore, the recode and continual reconfiguration of the open space role appear to be at the basis of a renewed perception of the school, which recently has found itself taking on disparate functions.

We should assess what trajectories it is possible to describe for architecture to reconsider and support new forms of sharing and federation of functions, as well as activities without invalidating, however, the precision, clarity and pertinence of architectural organism, so as to invert the model of spaces inadequate to meet the needs and requirements of present and future collective life.

Further, we need to inspect how these poetics of architecture, exceeding frontiers of context, function and genre, compete on the international stage, spreading from North America to countries with strong cultural traditions, such as England, Germany and Spain above all, the emblematic character that overpowers their function.

In contrast to these tendencies, Italian architecture appears more disposed to a greater rootedness, probably due to the extraordinary settlement framework of the territory: the famous one hundred cities of Italy, the frequency of the so-called historical centres, and the looming of monumental structures on the profile of our urban settlement. The case of Giuseppe Terragni (Zevi 1980), with the "Sant'Elia" Kindergarten in Como in 1934, redeems, within a demonstrative pedagogical programme, the civil connotation of modern Italian architecture (Fig.5). An attitude that Bruno Zevi defines as an authentic architectural invention in setting up the structure of a complex organism conceived to instil exclusive space use behaviour. After the First World War, along the fase of the reconstruction, it is possible to assume here, provisionally generalising, that this typology has always exercised, or at least aspired to exercise, a role promoting settlement, a "polo-genetic" part. This role has been played both in terms of functional condensation, as a decisive compensation for the imbalances induced by the proliferation of metropolitan suburbs, and as a figurative cornerstone of urban development, like a representative appearance in the city's architectural landscape.

The post-war reconstruction years were affected by research that breaks the

Fig.3. Eugène Beaudouin and Marcel Lods Ecole de Plein air in Suresnes, Paris 1932-36.

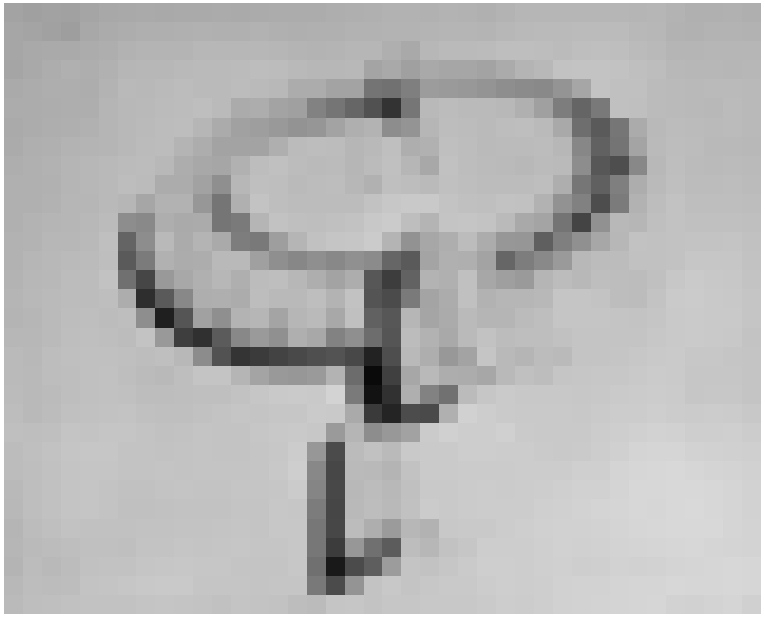

Fig.4. Richard Neutra, *Ring Plan School*, Rush City Reformed, 1926.

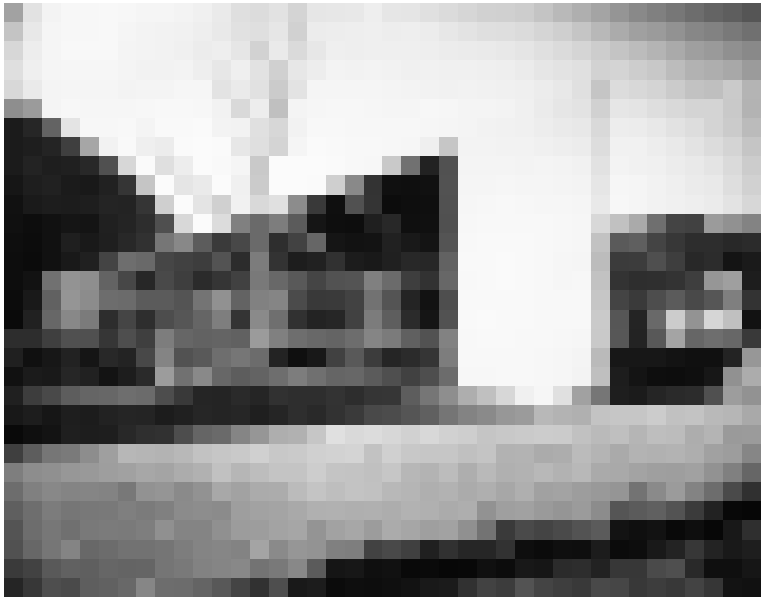

Fig.5. Giuseppe Terragni, *Sant'Elia Kindergarten*, Como, 1934.

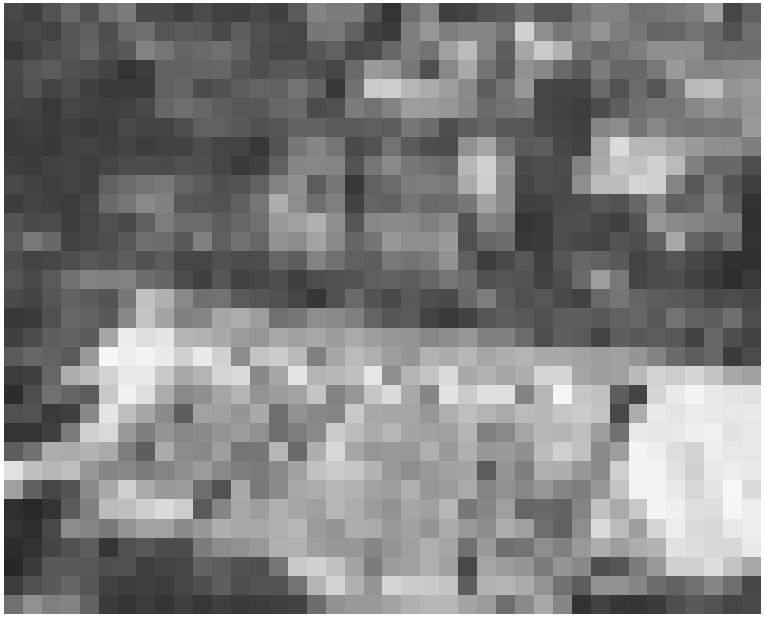

Fig.6. Hans Scharoun, *Geschwister Scholl Schule*, Lunen 1956.

typological structure out of its compactness and articulates it into an organism configured according to different levels of freedom. The case of Hans Scharoun's Geschwister Scholl Schule in Lunen 1956 (Genovese 2001) alludes to a programme anticipated with the project for the Darmstadt School in 1951 but never realized (Fig.6). Here, all the conceptual elements by free trajectories have been already listed. We can assert unusual signs, for a disjointed sequence of classrooms that gather around clusters of space within which the typical cell, the lecture hall, reiterates itself freed from any possible functional constraint.

By contrast, the prototype realised by Jørn Utzon, School Centre in Herning in 1969 (Forés, 2006), traces a possible experimental trajectory, where the diagram of the different functions superimposed on a complex and articulated pedagogical proposal (Fig.7). This pursuit contradicts the conventional evaluation at the basis of this work, resulting from a grade of undifferentiated additive formula.

The articulation that takes on a demonstrative value with Miguel Fisac's Instituto Laboral in Daimiel, 1953 (Fisac 1953), where beyond the Nordic ancestry (the framework of Paimio's Sanatorium in the plan is quite evident) (Fig.8). The expectation of a project portrayed in a functionally paradigmatic diagram exemplifies the genuine commitment of that proposal as a social space and demonstrates the popular role of Spanish architecture. On this line, the exemplarity of civil attempts made by Mario Ridolfi (Tentori 1961) defines an original suggestion for the contemporary role of educational space. With the Olivetti Kindergarten in Canton Vesco in 1954, Ridolfi marked the importance and ascendency of craftsmanship, in contrast with the mimetic seriality of industrial production, of fantasy, of excess, of the individuality that is living organisms, against the rigour and standardization (Fig.9). Such a proposition was exemplarily aligned with the rigorous implantation in South American educational communities: Joao B. Vilanova Artigas (Puntoni 1997), with the Ginásio de Guarulhos in São Paulo in 1960, is one of the paradigmatic cases that embodies the transposition of school enclosure, set up to channel a real community into a condition of social marginalism (Fig. 10).

The rate of the exaltation of figuration, driven to intercept that plastic tender of the best tradition of modernism, portrays a way of the expression of emancipation from the alleged backwardness of popular culture: an ethical jolt, opposed to the Paulist bourgeois, the homeland of the internationalist provincialism.

Fig. 7 Jørn Utzon, *School Centre*, Herning,1969.

Fig.8 Miguel Fisac, *Instituto Laboral in Daimiel*, Daimiel 1953.

In this condition, one must ask oneself whether, for the purposes of a representative characterisation, in today's architecture world, the dominant functional theme still prevails or whether, vice versa, the project lends itself to adhering to the most diversified opportunities, so much so that this attitude has even recently theorised through a virtual disposition to what is today pervasively defined as the multiform "resilient" but in fact merged into an anonymous type-morphological undifferentiation directly proportional to its architectural irrelevance.

And yet, on closer inspection, it seems evident that in recent times, even in school architecture, themes emerge that are considered more reliable than others in rendering, perhaps allegorically, the most significant part of an author's poetics.

See in this regard how some of the most convincing evidence is due to a generation of Italian architects who have transferred that authentic representative vocation of the school building to this theme, proposing it as a monumental dominant in problematic contexts of urban marginality.

Numerous experiences in the sphere of modern city building can be taken as a cognitive reference concerning the problem of the school building.

Let us recall, to mention a few of the most significant ones: the initiatives of industrial paternalism and municipal providence in Milan and the Lombardy area and in the various cities of manufacturing Italy, where the services of the first industrialisation (alongside schools also hospitals, boarding schools, economic kitchens), at the beginning declining the new typologies of the first industrial take-off set themselves as free strongholds on four fronts, at the same time generators of an urbanisation 'by poles' as authentic 'social condensers' and monuments of new forms aimed at compensating for the precarious urban and housing conditions of the city fringes in terms of functional-behavioural richness and figurative representativeness.

The work of Carlo Aymonino, Guido Canella, Aldo Rossi, Giorgio Grassi, and Antonio Monestiroli, just to name a few, on the theme of the school, generated, in various ways, nuclei of services built even in the suburbs and hinterland of Milan in the 1970s, where original typological-functional devices formed a veritable social framework.

Fig.9 Mario Ridolfi, *Asilo d'infanzia Olivetti a Canton Vesco*, Ivrea 1954.

Fig.10 Joao B. Vilanova Artigas, *Ginásio de Guarulhos*, São Paulo, 1960.

And on this side, it is then almost a compulsory step on the horizon of contemporary architecture and the city to attempt to re-engage the contribution of Italian architectural culture on specific discriminating characteristics, which may be, for that generation of architects, identifiable, for example, in the physical centrality, so that the work of architecture, rather than mimetically adapting to its surroundings, assumes full representative responsibility, proposing itself as a dominant monumental as in the case of Aldo Rossi, for example, the Primary School in Fagnano Olona, 1972 (Fig.11) (Bonicalzi 1972); or in the definition of typological-functional devices, as in the case of Guido Canella. With regard to of the Primary School and Kindergarten in Zerbo D'Opera (Christofellis 1976) on the southern outskirts of Milan (1972), engaged in creatively combining new patterns of behaviour and figurative innovation's framework, in an attempt to compensate a large part of the city's outskirts with a minimum endowment of public and collective benefits and facilities, and at the same time to oppose, with the architecture itself, the processes of territorial and cultural homologation in the post-reconstruction and post-economic boom years (Fig.12).

The figurative suggestion that concerns Carlo Aymonino, in 1970 in the case of the "Campus Scolastico in Pesaro" (Aymonino 1980), imposes a skilful exemplary connotation of the typological variants adopted. Aymonino proposes the allegory like an allusive reference to that virtual identity of synthesis, placed by every city, in what sociologist Maurice Halbwachs has called collective memory, to which functional polyvalence is adapted, giving rise to two distinct perspectives: exterior and interior (Fig.13).

On the other hand, in today's changed structural conditions and in the same new orientations of international architectural culture, especially concerning the most advanced geo-economic areas, it seems that architecture that claims to be of quality tends increasingly to disregard its structural essence and the contextual horizon to which it is assigned, as well as a functional mandate that is considered increasingly inert and from which the most current design culture seems to consider itself completely detached.

So that, for example, an ever-growing difference seems to arise between the 'habitable sculptures' of the most widespread contemporary international trends - especially the deconstructivist ones, apparently committed to exploring the communicative susceptibilities of a figuration now free from functional

Fig.11 Aldo Rossi, *Primary School in Fagnano Olona*, 1972.

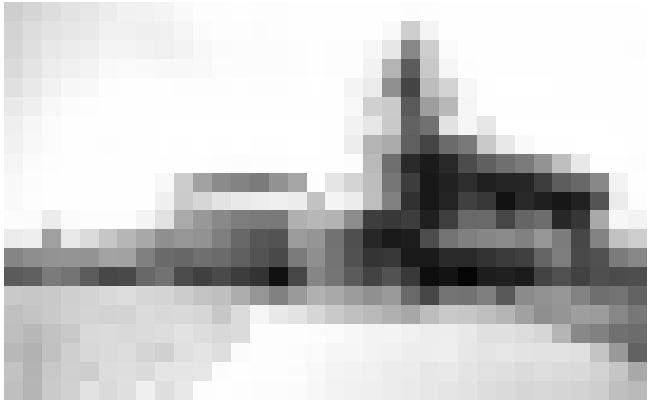

Fig.12 Guido Canella, *Primary School and Kindergarten in Zerbo D'Opera*, 1972.

Fig.13 Carlo Aymonino, *Campus Scolastico in Pesaro*, 1970.

obligations - and a European tradition (and especially an Italian one) still remarkable by an operative link with the city and history, by a persistent interweaving of functionality and figuration.

A working bond with the city and history, which cannot but recall the assignment of Ernesto N. Rogers, and his reflections on the theme of "Le preesistenze ambientali e i temi pratici contemporanee"("Casabella-Continuità", no. 204, February-March 1955).

And a persistent intertwining of functionality and function, which certainly does not mean a particular "Tayloristic" meaning of function, but a notion of civil functionality, which concerns both the relationship with the construction of the city and the necessary coefficient of representativeness of the public building.

It becomes significant, then, to ask oneself if and to what extent, for the purposes of a representative characterisation and a related capacity to affect settlement and destination, the dominant functional and structural mandate still prevails in today's architecture. Question that, if valid in general for the most recent poetic tendencies of international architecture, takes on specific values of particular interest in the case of the public building. Here the Lodolian precept of modernity is most clearly engraved: nothing is in representation that is not also in function (building must be unified with reason, and function will be representation).

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Beyond the school perimeter involving the neighbourhood

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In a period of rapid change, the central role of school and educational training in civil society has led to the renewal of the complex school sphere.

The possibilities of regeneration of the considerable building heritage involved are explored through the close link between places, spaces and life experiences, the practices conducted and the teaching methods that characterise them.

Responding to needs beyond functionality, regulations and standards with a sensitive and open attitude towards the humanistic and social components is also a prerequisite for the NEB - New European Bauhaus, the European Commission initiative promoted by Ursula Von Der Leyen. NEB is an interdisciplinary project around the terms «beautiful» for our eyes, mind, and soul, «sustainable» to regain harmony with nature, the environment and the Planet, and «inclusive» to encourage a dialogue between cultures, disciplines, genders and ages.

The dialogue between actions of artificialisation of space and the natural environment, in full awareness of the alteration of ecological-environmental systems produced by wrong development models, tends decisively towards the search for new balances. In every order and degree, the school sphere needs to absorb this careful look to propose a relationship between human actions and their effects on the environment as accomplices and participants in transformative strategies.

Updating and accountability for environmental issues involve the existing heritage and the culture of the project. Some experiences made in the disciplinary tradition, such as that of Richard Neutra (Neutra 1954), respond to the need to trace the identity of forms and ways of learning consistent with the most urgent contemporary issues.

In giving shape to innovative educational landscapes, the new ways of living space cannot avoid including the sense of belonging to nature and the

environmental context in every transformation action. Nature and architecture, accomplices, can reveal mutual resonances and correspondences in their forms. In this perspective, the UN 2030 Agenda places quality education for all at the centre of Goal 4 and emphasises how adequate school facilities and suitable learning environments are the preconditions for any hypothesis of sustainable development.

Relating to the morphological aspects, «the approach treats the urban space as extended and complex architecture; in this sense, it is mandatory to choose a progressive look that can focus at the same time on small parts of the city and predicting the general effects on the entire shape of the city. Fragmentation, recognition and complexity are three phases of the same design process. This comes from the chaos of an exploded structure (fragmentation), proceeds to the recognition of the quality of different parts (recognition), and it is completed in the link between them, namely in the relationship between the parties that leads a structure, even complex, from chaos to order (complexity)» (Di Franco et al. 2015).

The work conducted in the context of Inventing Schools and some other Milan Metropolitan Areas (the three international experiences below in the text) moves within these assumptions and searches for correspondences and reciprocity between pedagogy and architecture. The search for specific relationships between the actions and reactions of actors capable of expressing different points of view stimulates innovative teaching methods. At the same time, developing projects or micro-projects to renew spaces allows for the physical shape of creative spaces. Within the Inventing Schools program, in some cases, it was possible to involve local communities and pupils from each school directly.

The relationships with the health emergency and its consequences on the school organisation and the need to explore scenarios of different ways of using and reusing spaces also made it necessary to identify the current weaknesses in the various school types. Therefore, although the restrictions affected 2020/2022, the schools wanted to place themselves as an open and dialoguing place with local realities and the territory. The scenarios designed and still developed through Master theses, workshops, scientific research and laboratories work on the idea of a school that interacts with the context and whose presence and vitality go beyond the school perimeter involving the neighbourhood and the city.

The idea of an open and widespread school aimed at integrating school activities with urban spaces and the regeneration project involved the context of formal and strictly school spaces, such as classrooms, laboratories, libraries, canteens and non-formal areas. They were characterised by freer and more impromptu relationships, such as the atrium, the garden, the courtyard, the public park, the playing field, the street and the square.

IES - Integrated Educational Spaces: the School into the urban project in three international experiences

Complexity is a condition inherent within the urban phenomenon. This complex condition intersects temporality and spatiality without a unitary design or project. The possibility of controlling the complexity through points, fragments, and parts constitutes the challenge of the urban project, which aims to design partial possibilities of transformation through the understanding of the structures.

Nevertheless, it is possible to recognise some specificities in a city composed of many different sets and subsets. The character is not in the addition of its part but is composed of relationships, sometimes tricky or distorted, between the qualities of different areas. The composition and re-composition of spaces can update a character. Fragmentation, recognition and complexity are three phases of the same urban and architectural design process. As part of complex and multidisciplinary research, I present here three parallel experiences. The comparison with the strategies developed by visiting professors in MIAW 2022 is relevant and exciting.

1) The first scientific research agreement titled «*Public space and new educational scenarios on an ecological corridor, hidden in Milan's 21st-century city*»[1] experimented with alternative scenarios for transforming the built environment. The contemporary paradigms connected to the ecological and environmental components in the modern city are updated to understand the multiple configurations of the scholastic inhabited spaces. Architectural design, therefore, feeds on existing conditions, historical components on different scales, and morphological, typological and social characteristics. For those reasons, during the design experience, it was possible to cross different scales, times and fields, deal with new shapes in space, and design a cluster of educational buildings and open spaces. Through the provision of exchanges between different school classes and orders, the scenarios gave shape to some elemental correspondences: that of schools in their reciprocal relationships. Schools become recognisable places in the urban context, sites with identity and recognition, working together on campus. The campus, in this case, is the city. It is an updated centre for the community and all citizens.

The new educational architecture is part of the urban fabric. It is a complex, dynamic, open organism oriented towards circulating scientific and humanistic knowledge. The new Edu-Hub is, therefore, a vital organism focused on the relationship between architectural construction and external spaces, individual and collective places, and open, covered and internal spaces. The city's new Edu-Hub is connected with the environmental issue; it faces the polluted canal and the natural forest with its weeds. It truly becomes a space for didactic experimentation and research.

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1 Agreement - Convenzione Quadro- between Dastu- Department of Architecture and Urban Studies of Politecnico di Milano and Artkademy Cultural Association for studies and research on the (Micro) Urban Regeneration Process of the internal margin of the Canale Scolmatore Lambro Inferiore, from Naviglio Grande along Via Malaga, with adaptive reuse of the public areas and of the arches under the railway embankment owned by RFI. Parallel experimentation of methodologies for the re-activation of residual spaces and creative intervention in collaboration with the artistic production of Artkademy. Scientific Responsible Prof. B. Coppetti, Prof. A. Oldani, with arch R.Cavallaro, arch. F. Santonicola, in progress from April 2021.

2) The second international design experience moves from the idea that university research and teaching constitute interconnected spheres of work that mutually feed and contaminate each other. The design experience titled «*The renewal of learning space. The school as a common contemporary space, between architecture and landscape*» with the stimulus to internationalisation and social integration through inclusion policies is undoubtedly a phenomenon in progress at all school levels. In major European cities, the teaching spaces are subject to programs for replacing obsolete school buildings and to redevelopment and regeneration projects of existing structures. Within these assumptions, it seemed appropriate to submit the theme of the regeneration of school areas to the Master's students[2] for its relevance, inter-scalability and concreteness.

The core is the architectural-pedagogical-antropological renewal project of the existing public schools and relative appraisal. The public school is a learning space that should become an updated centre for an Educational Community. The architectural design experience grafts the research programme «*A Shared School. For a culture of Happiness*» (Coppetti et al. 2022), which won the New Generation Competition in the fight against child educational poverty. It is an interdisciplinary research project of construction and experimentation of a teaching model for the Public School that provides for the renewal of learning spaces and community spaces.

We experimented with an Open and Spread School project by integrating with the city. The project activities were carried out within the school and through the application of a didactic model oriented toward the well-being of children as a self-realisation process. The project is carried out inside and outside the schools selected, in the contexts of both formal and non-formal education, favouring an idea of the school as a recognisable place with a specific identity, a democratic place of growth, theatre of encounters, exchange and enrichment to experiment exciting relationships. The spaces dedicated to young people are at the service of a new way of thinking about school.

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2 Master in Sustainable Architecture and Landscape Design, Politecnico di Milano, Polo di Piacenza, «Architectural Design Studio - Sustainable Architecture» Prof. Barbara Coppetti with «Multi-criteria analysis and project appraisal» Prof. Angela Poletti, Tutors Arch. R. Cavallaro, Arch. F. Santonicola. a.y. 2019/2020

The new design for common areas is regulated with the sense of belonging of the children, teachers, parents, in and to the school. The aim is to define a solid relationship between the school and children. The goal was to give shape to an architectural project capable of giving recognition, to offer interdisciplinary perspectives where social criticality, marginalisation and sometimes violence seem to prevail. The re-design of the spaces such as the garden, trees, playground, canteens, places of welcome and paths, the analysis of solar geometries and the proposal of new shading systems for the open and internal spaces of the school are the objects of experimentation design.

The sample cases were the renovation project of the MAST community space + the regeneration of Federici Primary and Gold Medal Secondary School in Rho (Mi). With an architectural design process supplemented by moments of review and classroom lectures, the experience conducted with the students led to the sharing of three principal moments of exchange and comparison marked as follows. A) Students visit the city, MAST Space, Federici / Gold Medal School, and the reference context with the historical stratifications that have marked the urban fabric. The proposed design approach focuses on the experience of space and landscape to make concrete assessments of urban ideas and strategies capable of building an alternative narrative of places. A description corresponds to a slow pedestrian and cycle path along secondary paths. B) Meetings and Open Dialogues with the local community at the MAST space and with the Dean, the teachers and students of the school. On this occasion, we shared the space regeneration program with local communities. C) We fixed the goals: the MAST Community Space intends to propose itself as a new centre for young and intergenerational public life through the best definition of its own identity. We worked on the meaning of Co-learning, Co-studying, Audiovision, Theater, and Craft Room and on improving the Music Room and creating a Hub of ideas and a greenhouse or Eco-Garden Room with Fruit Forest. The nature trail to work on involves the Olona river starting from the Mast garden. The bank already has a stretch of cycle path, which should be engaged in an articulated and comprehensive vision of strategic regeneration on a broad scale, even if in poor condition and infested with weeds. The Primary and Secondary School students and teachers prepared a presentation on the workshop activities carried out in the school, and on the dreams, they would like to realise. The pupils' wishes

involve both the internal and external spaces of the garden and the adjacent public park. A new entrance with parental parking enriches the program, as well as the renewal of the school canteen; the redraw of the groundfloor spaces, an outdoor reading area to read books borrowed from the library; the playground with equipment in the park; a place with tables to have a snack; a science and nutrition laboratory connected to the greenhouse area; a larger music laboratory. D) In the middle of the process, we had a seminar on public school heritage between demolition and regeneration of existing structures hosted by the architect Simona Della Rocca, founder with Alberto Bottero of the BDR Bureau studio. They presented the experience conducted by TorinoFaScuola at the Enrico Fermi Secondary School. The presentation was followed by a common critic of the students' works: an opportunity for confrontation with the professional experience of carrying out the architectural and pedagogical updating project of a 1960s school structure in Turin's suburbs. E) Finally, the Mast Community Space hosted the exhibition. The participatory architectural design process made it possible to verify, with the secondary school community, the contents of the projects, the elements of the architecture, the materials and the design of the open spaces and interior spaces of the School and the Mast. It was possible to examine the forms that the students of the Master have given to the dreams of the little ones. Working with the children through the panels and the numerous physical models built for the exhibition was an exciting moment. "Around the world" snack accompanied the final moments of a laboratory full of contents, which saw a large and active participation of children, teachers and the head of the Institute. The students prepared a typical appetiser or finger food from their country of origin to share a convivial moment.

3) The third experience aims to give shape to the concept of space as a third educator (Malaguzzi 1995) explored on the occasion of the project developed for the International School Design Competition, New Pizzigoni School Complex in Milan (July-September 2019). The project developed by B. Coppetti, D. Ferrari, P. Ruggiero, P. Mei with R. Cavallaro, and F. Santonicola wanted to give physical form to an updated idea of a school that enhances existing resources. In the neighbourhood, there was a Kindergarten and a Primary and Secondary

school to integrate with Villapizzone Library, creating a new school campus. Among the design assumptions were clear the intention to bring out the new school in the neighbourhood through the clarity of its layout. The building and every part had to be recognisable and precisely named to make this objective intelligible. In this case, the new school's identity had to be connected to the ability to read its constituent parts accurately.

The «courtyard» proposes a consolidated figure in which the role of the central school spaces' open space and identity is that of a relational space par excellence. A square-shaped courtyard is a place of aggregation, an internal square for the community that uses the spaces on the ground floor at different times of the day. The yard is a balanced inner microcosm, silent and protected but lively because all the functions open to the neighbourhood overlook it. The elevations that delimit it are rhythmic and diversified, transparent towards the media library and with a covered space in front of the atelier of taste (Weyland B., Attia S., 2015) to eat outside. The side of the gym is permeable thanks to flexible opaque openings. The «public groundfloor» is accessible and usable by citizens; it is open to cultural, recreational, social and sporting occasions. The identity of the base and its ability to open up and welcome the whole community is expressed by a large entrance hall, with tapered openings to let natural light slide on the different floors, from the solid and durable material proposed that determines a strong, heavy and tectonic hoof. The intended uses are collective, biblio and media library, auditorium, school canteen and gym. The «educational space», as defined by Maria Montessori in the early twentieth century and taken up by Loris Malaguzzi as a «third educator» (Malaguzzi 1995), intends to stimulate behaviours and new uses by translating the most current pedagogical proposals into spatial quality, organisation of flows and control of the atmosphere in the different environments of the school. Updating teaching models aim to meet up-to-date personal development processes: innovative teaching and adequate spaces to implement it constitute actions in line with EU guidelines on skills, and inclusive development, contrasting early school leaving and educational poverty.

An inclusive school is a school that provides the following:

- Spaces for informal learning.
- Socialisation.
- Play as the glue of the group.
- Connective spaces can activate free relationships and foster relaxed moments of learning and sharing.

The classrooms and workshops allow different possibilities of aggregation of tables, each of a minimum of 62 square meters, and are equipped with individual cabinets to store materials. Classrooms and laboratories must be equipped to offer teaching tools that enhance the students and their potential. The «natural light» in the classrooms and laboratories controlled by adjustable external elements capable of blocking the solar ray from the outside, thus avoiding overheating the internal spaces. The artificial light provided in the classroom spaces must be diffused and adjustable to allow good darkening during screen use.

«Connective spaces» such as stairs, corridors and services are nodal areas as places of informal relations. They are areas for free activities, spaces for decompression, individual reading, and extra-curricular group activities, flexible and adaptable. Defined as connective spaces, they are characterised by warmer lighting that favours a welcoming and relaxed atmosphere. The project's terrace is an outdoor space for students to prepare performances and make music or theatre.

These spaces aim to create a relational connection between traditional and innovative teaching activities, ensuring that students do not live their school life in watertight compartments or in a coercive way. The aesthetic quality of the spaces can be traced back to an attitude based on the recognition of the school as a nodal place in the new generation's life and training. It is the place of the educating community, a learning environment open to the variation of didactic models and capable of encountering personal development processes so that each student feels recognised, supported and valued in his uniqueness.

Fig. 1 Connective spaces can activate free relationships and foster relaxed moments of learning and sharing: spaces for informal learning, socialisation, play as the glue of the group. International School Design Competition, New Pizzigoni School in Milan, by B. Coppetti, D. Ferrari, P. Ruggiero, P. Mei with R. Cavallaro, and F. Santonicola.

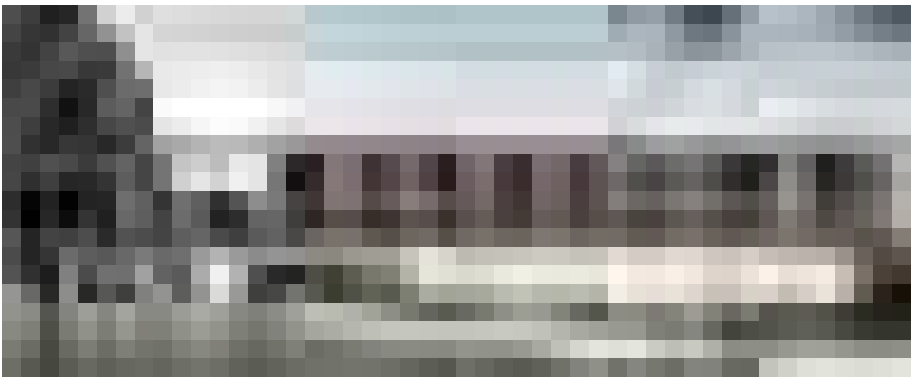

Fig. 2 The public groundfloor is accessible and usable by citizens; it is open to cultural, recreational, social and sporting occasions. International School Design Competition, New Pizzigoni School in Milan, by B. Coppetti, D. Ferrari, P. Ruggiero, P. Mei with R. Cavallaro, and F. Santonicola.

Fig. 3 Urban System: open spaces, connections and cycling paths in the new Campus in Villapizzone. International School Design Competition, New Pizzigoni School in Milan, by B. Coppetti, D. Ferrari, P. Ruggiero, P. Mei with R. Cavallaro, and F. Santonicola.

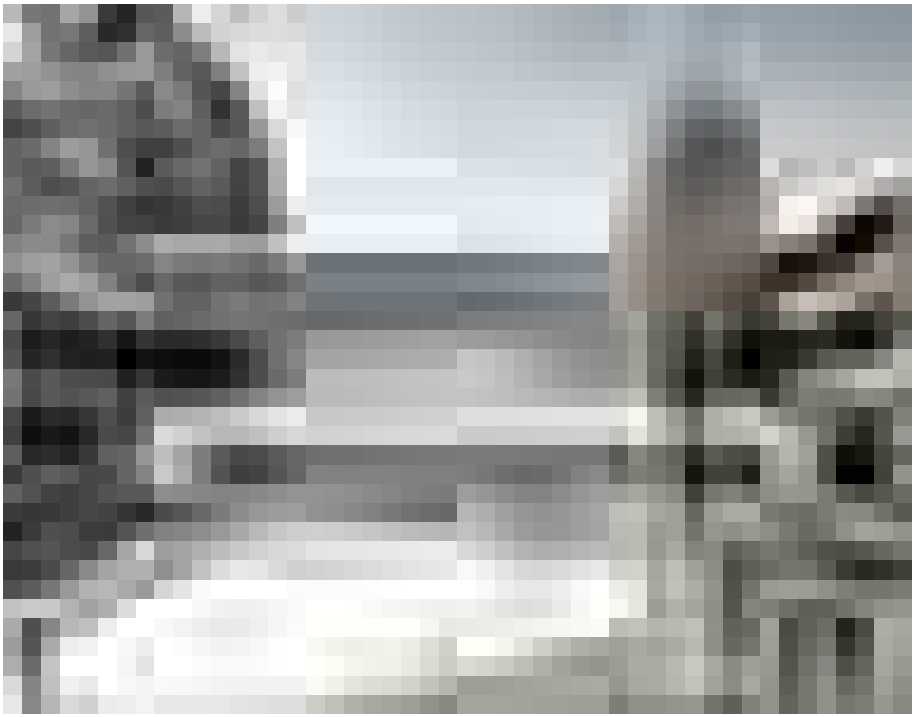

Fig. 4 The courtyard: the central school space, a place of aggregation, an internal square for the community. International School Design Competition, New Pizzigoni School in Milan, by B. Coppetti, D. Ferrari, P. Ruggiero, P. Mei with R. Cavallaro, and F. Santonicola.

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Schools and the city. Reflections on MIAW 2022

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MIAW 2022 workshop took the name of *Inventing Schools* on the back of the teaching experimentation project, coordinated by Barbara Coppetti and Elvio Manganaro, dedicated to schools, which promotes dialogue between the School of Architecture Urban Planning Construction Engineering (AUIC) and the Milanese municipal administration. The subject of schools was of crucial importance during the pandemic, which disrupted a system that was already undergoing a profound revolution with the advent of digital technologies. The school system reacted with enthusiasm and, in many cases, with skilled improvisation, managing to respond quickly with remote teaching.

This has led us to need to rethink the fundamentals of schools and their function, in terms of teaching and attendance, reimagining the spaces – in the interests of teaching securely – and reflecting on their relationship with the city.

Unlike the 2021 edition which had to be held completely remotely, MIAW 2022 was held in person between 6 and 17 June and it offered a return to normality, with opportunities for debate and discussion during the classes, public lectures by visiting professors – which had also been included in the New European Bauhaus programme – and a final presentation day with a jury composed of professors from the Politecnico. The workshop was opened on 17 May with a launch day held online, which was open to the public, for the purposes of introducing and meeting the participants and professors. The intention of this paper is to make a contribution to the recording of the international workshop experience, while providing some observations following an overview of the project outcomes.

Schools and the city

Schools are essentially an urban topic insofar as they are the place in which the concept of citizenship is formed, where the conditions for the future development of the community and community life are created (Consalez 2018). Citizens are created in schools and therefore the organisation of their spaces, both internal and external, and their relationship with the wider city is an urban-scale field of action, in which to incorporate wide-ranging projects, policies and interventions integrated across different scales (Renzoni and Savoldi 2019). School design is also strongly connected to pedagogical and teaching forms, and from this point of view, in recent years a radical change to the system has been observed, in particular following the introduction of new technologies among teaching tools and also following the Covid-19 pandemic, which turned schools into virtual spaces for everybody, for a significant period of time. As Consalez (2018) reports, the guidelines identified by INDIRE (Istituto Nazionale Documentazione Innovazione Ricerca Educativa - National Institute for Documentation, Innovation and Educational Research) are aimed at discarding "monosetting" in favour of increasing the number of learning spaces and opportunities, including by creating links to the city. The organisation of teaching involves moments that are either formal or informal, individual or group-based, and laboratories that need be delivered in a variety of spaces. A school is somewhat like a small city in itself, arranged into streets, squares and dedicated access areas. There are different levels of "public" space. The "connecting" spaces (for example corridors), play a fundamental role in this, being as they are places with functions for learning or breaks, breaking with the sole function as a distribution channel (Consalez 2018). Even the opening of school complexes to the community is a fiercely debated topic: spaces that during school hours are dedicated to the school, but which at other times are used by the city, as civic centres providing for suitable divisions and subdivisions which facilitate their opening and management.

Milan has a portfolio of school buildings that dates back largely to a major campaign in the immediate post-war period that was enacted on a national, municipal and provincial scale – of approximately 500 school buildings (in terms of infant, primary and secondary schools only), more than 300 were built between the 1950s and 1970s (Renzoni and Savoldi 2019). This intense period

of construction responded to a pressing need for citizen services which abated in the 1980s when the trend of population growth inverted and the response to the demand seems to have been exhausted. However, these buildings were largely constructed on the basis of the principle of efficiency; therefore, reduced costs and rapidity of construction, obtaining as a result the creation of a *modus operandi* which has permeated throughout the industry's culture (Renzoni and Savoldi 2019).

School complexes are places in which it is possible to create a relationship with the city: on one hand, by opening them to the citizenry, extending their hours and offering integrated services; on the other, thinking of them in relation to the network of public spaces and services. Although the contexts are extremely different, for the sole purpose of broadening horizons by freeing them from the schemes imposed by our legislative and design history, it could be interesting to turn our gaze towards the countries of the Global South which, with scarce resources, have found themselves using multi-use models, looking to enhance the schools with other services. In these settings, the school becomes a focal point for services, where a meal is provided, where the teachers sleep, where refuge is taken from a tornado, where humanitarian aid is concentrated and where community celebrations are organised. Civic and identity-based values, as well as those of innovation, are concentrated in schools.

The international profile of the visiting professors and the students participating in the workshop made it possible to begin a discussion, with experiences arriving from very distant settings, both to better understand the proposals and teaching approaches, and to leave free rein to creativity, by imagining new urban scenarios, in order to then address the challenge of their application to real settings.

Project areas

A selection of five school complexes from the Municipality of Milan were chosen for the *Inventing Schools* project with the aim of addressing themes that cut across teaching, through project strategies that would focus both on an architectural scale and with reflections on its functions and internal teaching, and on an urban scale, working on the relationship of the schools with their neighbourhoods. It is with this aim that the information materials were provided for the workshop, having been created by the corresponding tutors, providing a

multi-scale picture of the five schools. The first school was that of Via Carnovali, a complex with a nursery, pre-school and primary school located in the north-east of the city, in the working-class neighbourhood of Precotto, formerly a separate town which was absorbed by the city in the 1930s. A little further to the south-west is the complex in Viale Sarca with a nursery and middle schools, in the former industrial area of Bicocca, at one time the site of large industry and now an important hub as a home to important elements of Milanese culture. Meanwhile, in the south-east of the city there is the primary school in Via Massaua in the Arzaga neighbourhood, a middle-class residential area since the '60s. Two of the other complexes selected are located in the north-west of the city: a primary school and two secondary schools — one of which Montessori — in Via Quarenghi in Lampugnano, a residential area which is hope to a considerable number of foreigners; and a complex comprising a nursery, primary schools and middle schools in Via Graf in Quarto Oggiaro, a residential area of state housing which was created in the mid-1900s.

The selected schools were varied, both in terms of the level of teaching, their functions and regulations, and for the neighbourhoods in which they were located. This provided the visiting professors and students with a range of situations with which to interact.

Five approaches to the topic of schools

Visiting professors 2022

The visiting professors for the 2022 edition represent extremely varied perspectives, both for their different experiences, in terms of teaching and projects, and for the cultural contexts of their backgrounds and training. Among the professors invited was Elsa Prochazka, comes from Vienna, where she leads her architectural practice, in addition to having had international teaching experience with the University of Kassel, Bartlett at University College London, the University of Art and Design Linz as well as the University of Naples Federico II and the Politecnico di Milano in Italy. Her work as an architect has always complemented her teaching work, thereby enriching it.

A second section was guided by Giancarlo Mazzanti, a renowned architect

who hails from and has worked in Colombia, in Bogota, having trained in Italy at the University of Florence. There is no need to list his professional experience which covers international projects which have focused on social aspects and the empowerment of local communities, whereas his teaching work also spans many contexts, from various Colombian universities to Princeton, Harvard and Columbia University, without mentioning the exhibition of his work in permanent collections at MoMA and Pompidou. Mazzanti has long been working on the theme of schools, as he did for the 2016 *Atlantico Kindergatens* project for which, following floods in the region, 31 nurseries were designed using a form of co-design with the residents (Serrazaetti 2021). Karin Hofert, however, has a much more academic and theoretical research-based approach, having been trained at the ETSAB Barcelona School of Architecture - Universitat Politècnica de Catalunya (ETSAB-UPC) where she has also spent her career. Maintaining this as her base, Karin has been invited to many universities across all continents. Her work also extends to the field of cooperation and development and she has received numerous awards for her public space designs. Mladen Jadric also comes from the Viennese school, where he has also taught at TU Wien. He has worked in various universities across Europe, Asia, Australia and South America as a visiting professor and guest lecturer.

His work is primarily linked with the professional firm JADRIC ARCHITEKTUR ZT GmbH, delivering many projects in various parts of the world and on various scales, from urban to architectural, and also including installations and experimentation with new materials and technologies. He also holds positions in Austrian art and architecture institutions.

Lastly, Mia Roth-Čerina, who represents a different generation with respect to the other professors invited, carries out intense teaching and professional work, paying specific attention to school buildings and public spaces. She was trained in architecture at the University of Zagreb where she obtained her research doctorate in 2015. She has won many prizes for her architectural designs and she is part of prestigious juries and committees while more recently in 2019, her professional work won the prize for the best design for the Popovača primary school. Her intense professional work is accompanied by equally demanding teaching at her alma mater where she has been Vice Dean since 2016.

This wide range of experiences, in terms of teaching and professional activity,

represented an opportunity for the students involved to engage with teaching methods that differed greatly and to be able to absorb completely new stimuli directly, or indirectly by attending the public lessons or by coming into contact with the other sections.

The return to in-person teaching

Finally, after two years of pandemic, it was possible to return to intensive teaching with continuous direct interaction.

The face-to-face days were preceded by an online meeting: the kick-off saw institutional contributions, a presentation of the project areas and the themes of the workshop and was complemented by a lesson from Beate Christine Weyland of the Free University of Bozen-Bolzano.

The professors were constantly engaged with the students from the beginning of the workshop at the Milano Leonardo campus, alternating between site visits, classroom work and public lectures.

Finally, the students were able to compare the models on paper, and the opportunities to be able to return to experimentation with the research models was widely used by all of the professors that had been invited.

The public lectures

The public lectures were also thought-provoking and were extremely important. The days devoted to the presentations by the visiting professors were held in person at the IIIB hall of the auditorium in Via Pascoli on 9 and 10 June, with the possibility of taking part remotely. These formed part of the parallel events of the New European Bauhaus festival. The lectures were conceived not as moments of direct teaching, but of discussion and debate between the various schools involved. Indeed, the first day saw a debate between Jadric, Mazzanti and Roth, which was moderated by Magni and with Chizzoniti, Coppetti and Manganaro as discussants from the Politecnico. On the second day, Hofert, Prochazka instead debated with Bricocoli, Ferrari, Lombardini and Fioretto, while Setti moderated.

Innovations and contributions to the school - city relationship

The methodological approaches of the various international professors were extremely different, as were the methods of implementing the projects on a neighbourhood and urban scale. Elsa Prochazka's workshop identified the school as a tool for dialogue with public space, attempting to extend education beyond school hours and also in relation to the city. The projects developed by each of the five groups for all of the five project areas followed *Floating Schools*, a six-point manifesto which included: permeability (1), making contact with the neighbourhood, the institutions (2), investigating hybridisation with the public, expanding the usage and the combination of spaces (3) and the means of access (4), the quality of the spaces and the environment (5), not limiting itself to colours and furniture, and that of open spaces (6).

Karin Hofert instead approached the issue in a more typological way. Her class identified a design strategy that could be applied to the range of settings by determining five base modules that defined the learning spaces and which, by multiplying them, create special spaces such as gyms or theatres. The collection of modular systems in horizontal systems generated a variety of sections and prospects that have also defined the in-between spaces for "informal" education activities. The aggregative strategies were defined as attached boxes (1), detached boxes (2), spacial grids (3), vaults (4) umbrellas or trees (5) and each group tested them on two areas. With this approach, the spaces for special uses were of important in creating a connection with the neighbourhoods, in that they were located in a strategic way for direct access.

Mia Roth's class instead investigated the potential evolutions of public space, attempting to understand what educational spaces bring, not only to children, but also to their families, the neighbourhood and the city. On this basis, and by investigating a series of good practices and ways of thinking, the class defined five approach strategies, all of which involved a connection with the neighbourhood and adaptation to the identity of the environment. The first, a (kinder)garden school + urban farming, examined the value of direct contact with nature; the second, *didactic stack + public condenser*, focused on bringing together different communities; the third, *communal school + extended learning*, focused on making schools a space for various users and on various scales, extending the teaching

programme to activities for the community; the fourth, *laboratory school + startups and makers,* worked on the integration of creative and cultural activities; and finally, the fifth, *the school system + neighbourhood pedagogy* expanded on the concept of contextual learning.

Mladen Jadric's workshop instead addressed the theme of school design from an ethical perspective first and an aesthetic perspective second. The great challenge for the five project groups, each concentrating on two project areas, was that of resolving the complexity of the relationships between the spaces for individual learning and those of the environment, striving for connections with a view to large-scale integration in the neighbourhood. The designs were developed by organising the spaces for "formal" learning, characterised by the diversity of their dimensions with a view to providing greater flexibility, centred around a common area, a space for sharing which is increasingly involved in the learning process.

Lastly, the aim of Giancarlo Mazzanti's workshop was to create mechanisms and disrupt legacies, so that architecture might become a strategic tool for the common good in order to create the basis for the development of social relations, taking great care over the impact that architectural design has in the immediate vicinity. Play is crucial in Mazzanti's teaching approach to design work. It is a device, a composition tool, in which architect and user are both responsible for the creation of the architecture. This leads to profound interaction with the city, above all from the standpoint of identity issues. At the conclusion of the 10 intensive days, the professors expressed a high degree of satisfaction with the work performed by the students and their capability of working in groups.

Final considerations

Schools are excellent resources for neighbourhood activities, community activities and the services they offer in their spaces, and they must be seen as part of a neighbourhood and urban system, so that schools may be an element that experience different activities and are experienced by different social components, at various times of the day and year.

Moreover, it is increasingly apparent that schools represent the physical

location in which the basis of a community is formed. It is the place where citizens are created due to the function of the relationship between pedagogy and architecture and the relationship with the local community and with the wider urban setting. School design forms a part of a network of services and of public spaces, and its accessibility is widened by reaching various social components and, sometimes, taking inspiration from contexts further afield, to give schools, including from an architectural perspective, the characteristic of an identifying element of reference for the entire community.

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The state of the Italian school buildings: an overview

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«This morning I visited the building to verify that the work was done in accordance with its history, as indicated by the Soprintendenza/Superintendency – wrote the Mayor [of Milan Giuseppe Sala] on his social profile -. School building interventions are among the most complex and time-consuming to carry out, both because they often concern buildings built a long time ago». (Sala n.d)

What was written by and about the Mayor of Milan Giuseppe Sala in May 2021 is showing the difficulties that the adaptation of school buildings has, even In Italy. An intervention that becomes more complex if we are dealing with a restricted asset pursuant to the Cultural Heritage law of 2004 (and its upgrades). This, in fact, means adding a further constraint to those to which buildings, in general, and school buildings, as particular subject of this paper, are subjected. All this in the light of the need for a functional adaptation, in particular with regard to the new pedagogical and, therefore, didactic needs, to which the existing buildings do not seem to offer an adequate response.
The "reform" of school buildings in Italy has been a binding issue since the unification of the country, i.e. from the second half of the 19th century to nowadays.
Making a very summary distinction, the theme of the school building was, until the 1970s, mainly linked to pedagogical, learning, education and training criteria. From the 1970s onwards, attention to the school building took into account not only the necessary criteria for good planning, considering teaching and shared spaces, leisure and refreshment areas, but also the maintenance of the structures of existing ones.
The Seventies constitute an important time period for Italy (and not only!).
Referring to the seismic framework law, Law no. 64 of 1974, "*Provvedimenti per le costruzioni con particolari prescrizioni per le zone sismiche/Provisions for buildings*

with particular requirements for seismic areas"[1], it is reasonable to assume that, at that time, attention to the adequacy of existing school structures was paid.
In fact, a specific extension of the laws for new buildings and the relative seismic verification is proposed in the Ministerial Decree of 16 January 1996.
In more detail, it may be worth presenting a very brief overview of the legislative evolution that has affected existing Italian buildings and, therefore, school buildings.
With the Ministerial Decree of 27 September 1965 there is the introduction of the list of buildings subject to fire certification, among which school buildings are enumerated in point 95. This was followed in 1982 by a new list and, therefore, by the ministerial decree of 30 November 1983, about fire prevention terms, definitions, general definitions and graphic symbols (and subsequent updates).
In the 1970s, the principle of saving oil was suggested with the introduction of a behavioural act known as Austerity, which also recommended the need to contain energy consumption with the consequent revision of the use of heating systems.
"*On November 22, 1973, the [Mariano] Rumor government approved the "Austerity" decree, which included measures to save energy, such as blocking the circulation of cars on Sundays, lowering the temperature of the heating systems, the early closure of shops and offices.*" (Giovagnoli e Mieli 2020)
Law 373 in 1976, three years after the "*oil crisis*" which interrupted the supply of oil from the OPEC countries, introduced the issue of energy efficiency in buildings, taken up again with law 10 of 1991 and legislative decree 192/2005, the latter in line with the European recommendations aimed at accomplishing the "*ambitious objectives of the Green Deal*" according to which Europe aimed to become the first continent in the world to achieve zero emissions by 2050 (after the first phase of greenhouse gas reductions of at least 55% by 2030)." (Meloni 2021)

Law 13/1989, with its regulation, for instance the D.M. June 14, 1989, n.236, introduces the theme of accessibility for disabled people to both public and private places, inviting an innovative reflection on the ways of adapting school

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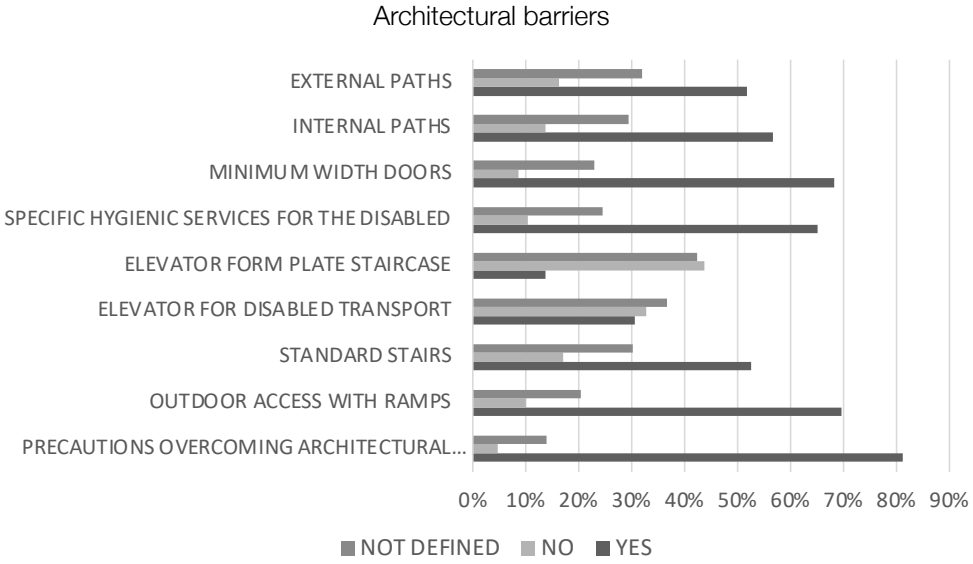
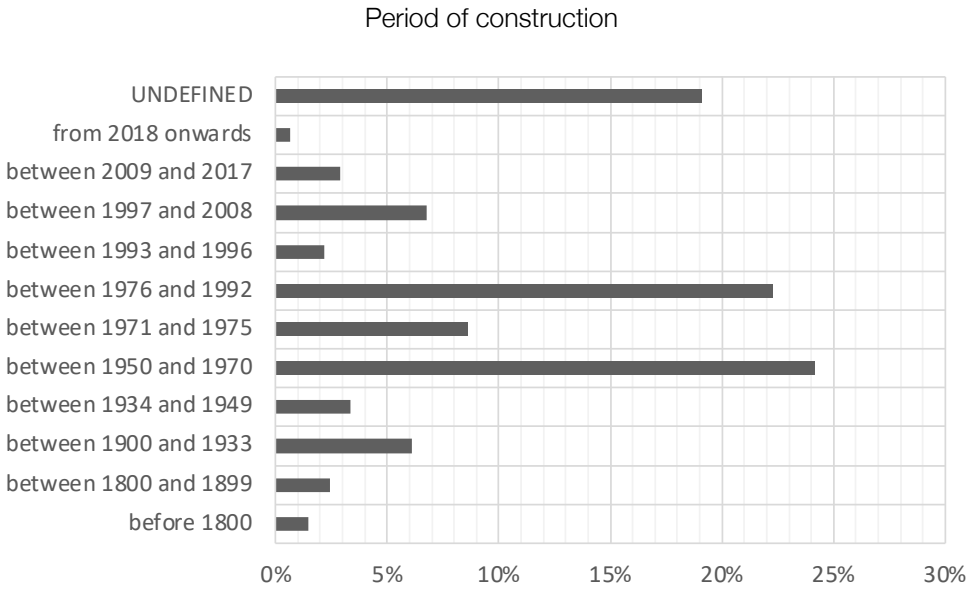
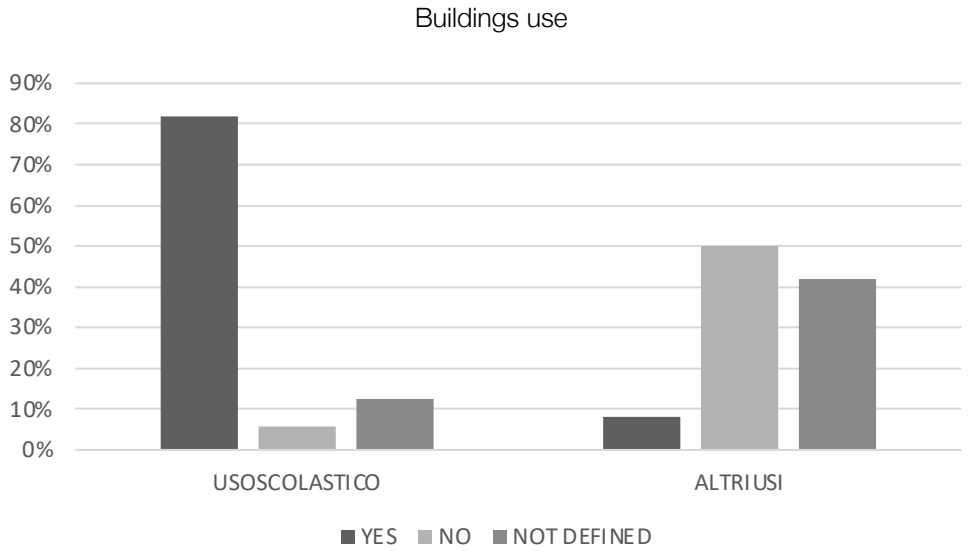
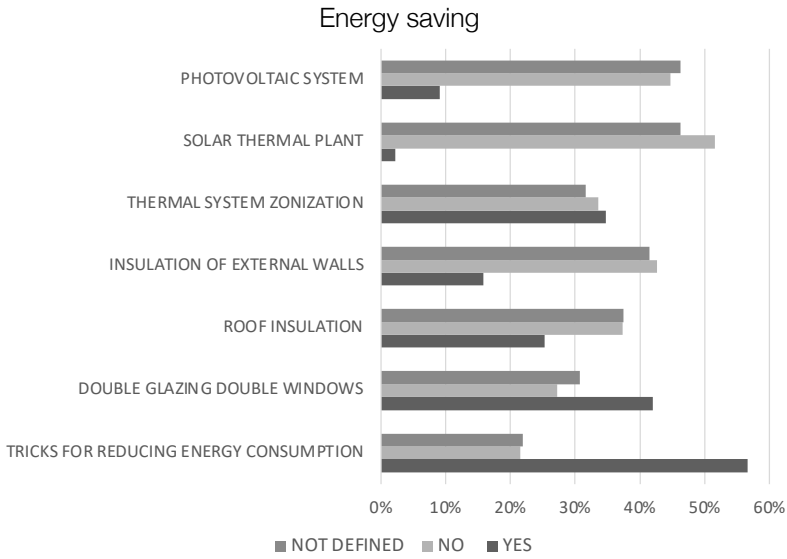
1 The translations of the laws' titles are by N. Lombardini.

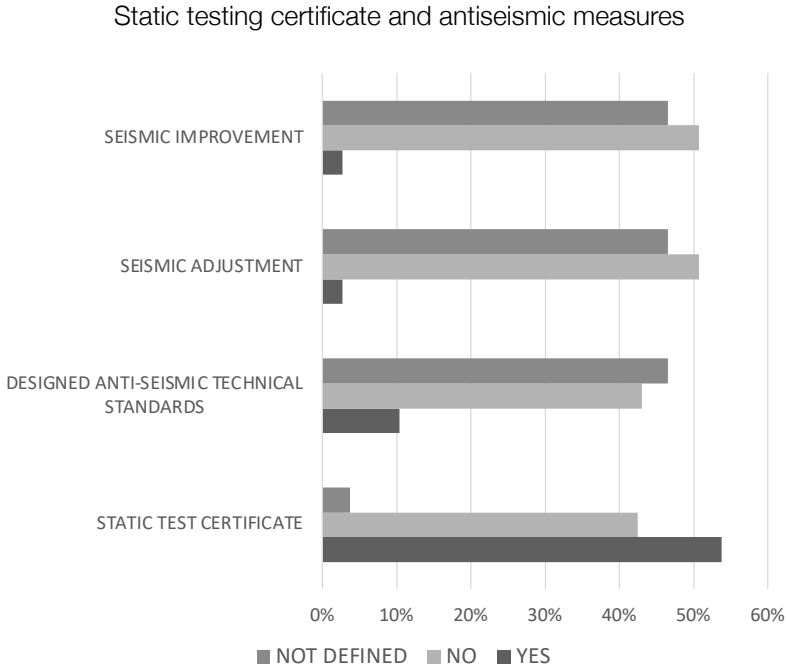
buildings, as is then explained in the title 5th DPR July 24, 1996, n. 503.
From what has been said, albeit in a summary way, it can be seen that only school buildings built from the second half of the 1990s onwards should meet all the technical and usability requirements according to the legislation (no reference is made to educational and/or pedagogical).
Furthermore, in fact, it is necessary to arrive at the *Norme Tecniche per le costruzioni/Technical Standards for constructions* of 2008 (and subsequent updates) to reach the criteria for the structural, static and dynamic verification of existing buildings.
Referring to the school building register, activated by the Ministero dell'Istruzione/Ministry of Education (since October 2022 Ministero dell'Educazione e del Merito/Minister of Education and Merit-) (Edilizia scolastica, n.d), the situation of Italian school buildings in 2020-2021 with respect to the categories identified and surveyed by the Ministry itself reveals what is summarised in the following graphs: it is an elaboration on the data available on the Portale Unico dei Dati della Scuola/Single Data Portal site of School by Ministry of Education.

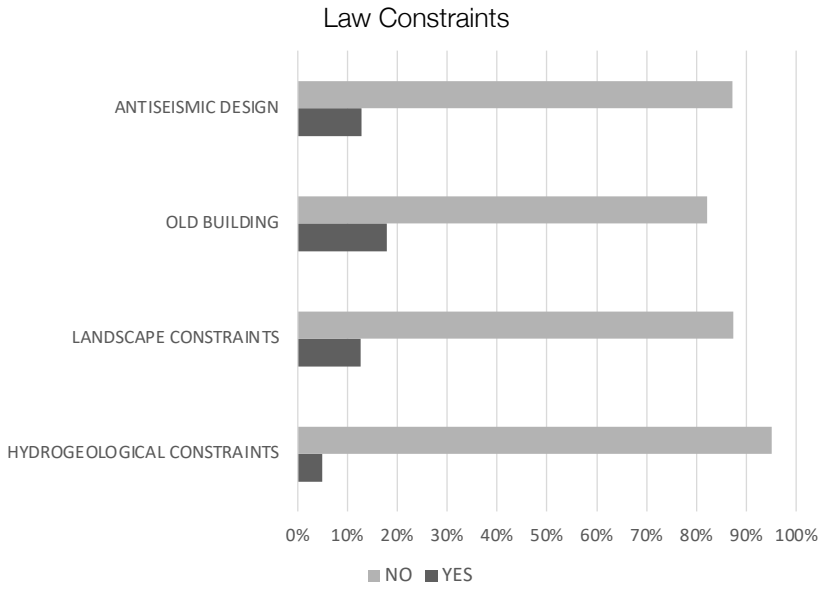


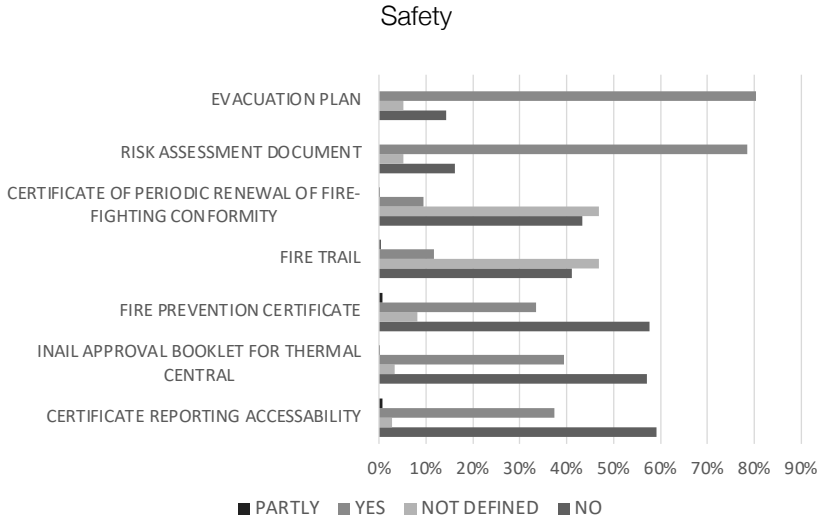

Period of construction
UNDEFINED
from 2018 onwards
between 2009 and 2017
between 1997 and 2008
between 1993 and 1996
between 1976 and 1992
between 1971 and 1975
between 1950 and 1970
between 1934 and 1949
between 1900 and 1933
between 1800 and 1899
before 1800
0%
5%
10%
15%
20%
25%
30%


Buildings use
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
USOSCOLASTICO
ALTRI USI
YES
NO
NOT DEFINED


Energy saving
PHOTOVOLTAIC SYSTEM
SOLAR THERMAL PLANT
THERMAL SYSTEM ZONIZATION
INSULATION OF EXTERNAL WALLS
ROOF INSULATION
DOUBLE GLAZING DOUBLE WINDOWS
TRICKS FOR REDUCING ENERGY CONSUMPTION
0%
10%
20%
30%
40%
50%
60%
NOT DEFINED
NO
YES


Static testing certificate and antiseismic measures
SEISMIC IMPROVEMENT
SEISMIC ADJUSTMENT
DESIGNED ANTI-SEISMIC TECHNICAL STANDARDS
STATIC TEST CERTIFICATE
0%
10%
20%
30%
40%
50%
60%
NOT DEFINED
NO
YES





Graphs pp. 83-86: data improved by N. Lombardini and available on the *Portale Unico dei Dati della Scuola/Single Data Portal site of School* by Ministry of Education (https://dati.istruzione.it/opendata/opendata/catalogo/elements1/?area=Edilizia%20Scolastica&&pk_vid=4334f4f69ef36a3116695584993015d8 [Accessed 2022/11/11].

The graphs show that 55% of school buildings were built between the post-war period and 1992, before the entry into force of the 1996 seismic legislation, even if these buildings should have accessibility and energy efficiency features which, in any case, do not meet to current standards, (it is necessary to consider that the energy certificate was introduced in 2005).

1996 was also the year in which law no. 23 of 11 January "*Norme per l'edilizia scolastica /Regulations for school buildings*", introduced *l'Osservatorio e l'anagrafe dell'edilizia scolastica /Observatory and the register of school buildings* (Camera dei Deputati, 2022). The law (updated by the law 08/08/1996, n. 431, which undertakes to facilitate the interventions) was simplifying the emergency procedures and delegating the individual institutes in the matter of ordinary extraordinary maintenance on the funds of the owner bodies, such as municipalities and provinces/metropolitan areas, articles 6 and 7 of law n. 23 of 1996 and law 56/2014.

The graphs are showing, briefly, deficiencies in terms of adaptation, seismic behaviour and energy efficiency.
Moreover, the safety of the buildings is based more on evacuation plans rather than the strategies necessary for firefighting.
The data highlight the need of certifications that are able to attest to the state of the school buildings (in relation to the nowadays rules) which, moreover, in the vast majority, seem to be free from cultural heritage and landscape constraints.
The envisage that emerges is that of a state of school buildings which requires constant attention, in terms of structure and risk control, and which needs improvements in terms of energy efficiency, which has so far been obtained by taking into account the comfort of users but not for optimizing energy saving. (Ministero dell'Istruzione – Scheda di rilevazione, nd)

In Italy there are more than 40,000 buildings that house one or more school complexes, sometimes combining different uses.
Precisely starting from the register of schools, improved in 2013-2014, funding was provided which made it possible to activate "*minor maintenance, decoration and functional restoration interventions*" and the "*safety*" (Edilizia scolastica – Scuole belle, n.d; Edilizia scolastica – Scuole sicure n.d) of approximately at least 8800 school buildings. The INDIRE, Istituto Nazionale Documentazione

Innovazione Ricerca educative/National Institute for Documentation Innovation Educational Research, through the PON-GIES project, Management of School Building Interventions, has activated a process of surveying the investments of the European structural funds in the building sector starting from 2014. (INDIRE, n.d.)

At the same time, the "*Scuole Nuove/New Schools*" project allowed 454 Italian municipalities to draw on the necessary funds "for the construction of educational institutes or for the complete renovation of existing ones" (Edilizia scolastica – Scuole nuove n.d). Added to this is the "*Scuole Innovative/Innovative Schools*" tender which in 2016 launched a competition of ideas relating to projects for almost 50 "sustainable" school buildings. (Edilizia scolastica – Scuole innovative, n.d). Considering the competition for the school in Castiglione del Stiviere, after the launch of the competition in 2016, the construction of the building started in 2022. (Provincia di Mantova, 2022)
The *Portale Unico dei dati della scuola/Unique Website of school data* was formally established with Law 107 of 2015 (c.136)". In October 2019, the *Nuovo Portale dell'Anagrafe/New Website of the School Registry* was presented: "at the date of the last update of this subject, in Italy there is a school building stock made up of 40,160 active buildings belonging to local authorities. The static test certificate (mandatory for reinforced concrete buildings from the date of entry into force of Law 1086/1971) is possessed by 21,591 buildings, the fire prevention certificate by 9,824 buildings, the conformity to standards by 15,687 buildings. The emergency plan is owned by 31,835 buildings. There are 5,117 active buildings designed or subsequently adapted to anti-seismic technical standards." (Camera dei Deputati, 2022)
Based on these data, the new policy for the distribution of economic resources for school buildings was carried out, with the main lines of financing, which at the start of the activities of the new government, in office since October 2022. The lines of financing and the most recent interventions in the field of school building are: "*The main lines of financing for school building: 1. The Single Fund for school building; 2. The "Nursery and kindergarten" fund; 3. The Infrastructure Fund; 4. The investment funds of the central administrations of the State; 5. The so-called EIB loans; 6. The resources of the Fund for extraordinary interventions of the Prime*

Minister; 7. The IRPEF 8x1000; 8. Contributions to provinces and municipalities; 9. The resources provided for in the National Recovery and Resilience Plan (PNRR). The most recent interventions in the field of school building: 1. Simplification of procedures; 2. Interventions for innovative schools and innovative childhood poles; 3. The extraordinary plan for adaptation to the fire regulations of schools; 4. The national energy efficiency plan for schools; 5. The extraordinary plan for the structural evaluation of the horizontal structures of attics and false ceilings for schools; 6. Interventions for school buildings in seismic areas; 7. Further provisions on school and university buildings"[2]. (Camera dei Deputati, 2022)

This summary excursus on investment policies and on the state census of school buildings offers a sufficiently exhaustive overview of the needs of school buildings in Italy.
It is clear that a large part of the resources involved have been and are to be allocated to existing school buildings, which need and "deserve" correct interventions, not only of a technical and technological nature, but also for adaptation to new pedagogical and training criteria. (Borri, nd; Alvisi, 2022; Ferrari, 2015).

The intervention on existing buildings, their technological, structural and functional adaptation, even if sometimes complex and made even more complicated by the fact that one may have to deal with listed buildings, even as cultural heritage, is certainly possible and necessary.
This is demonstrated, for example, by the interventions implemented by the Compagnia di San Paolo and the Agnelli Foundation (in collaboration with the City of Turin and the Fondazione per la Scuola) on the Enrico Fermi and Giovanni Pascoli school complexes in Turin in 2019. The winner of the "*The Torino fa scuola*" competition for restoration, launched in 2015 thanks to a total funding of 11 million euros, were the projects by BDR Bureau and Archisbang. The results, published in the magazine "*Abitare*", clearly demonstrate how the existing structures can accommodate new uses of the spaces, guaranteeing their accessibility. (Barale, 2019).
These two examples can show that improvement and adaptation are possible

2 Translation in English by N. Lombardini.

even if a different financial provision is needed. This, however, does not mean, in turn, that working on existing school buildings is more expensive or difficult than building a new one. The work on the existing structure must be preceded by a feasibility project that takes into account not only the adaptation but also the maintainability of the structures in the future. It is necessary to activate a virtuous process that does not, necessarily, impose incongruous and too expensive demolitions.

In the 1980s, Fioretta Gualdi and Riccardo Merlo, architects respectively involved in and responsible for the then School Operations Unit of the Municipality of Bologna, wrote as follows: "*The recovery of the existing building heritage was often opposed due to the prejudice shared by most of the people, administrators and technicians that renovating an old building is a stopgap solution. This is certainly not true if we take into account that each architectural product has characteristics that make it suitable for accommodating certain functions rather than others and it is therefore necessary that the choice of school destination be made following a correct analysis of the characteristics of the container ... .*"[3](Giovenale et al. 1982, 219)
Certainly, the legislation of the last forty years could have complicated the intervention criteria while the qualification of construction companies engaged in restoration and, more in general, in the intervention on the existing structures, has improved a qualification whose lack was complained of by Gualdi and Merlo. As highlighted by the *l'Osservatorio civico sulla sicurezza a scuola/Civic Observatory on School Safety* (Bizzarri, 2021, 4) "*acknowledgment must be given to the last Governments* [2014-2016], *which, starting from 2015 as never before, have reversed the course on school construction..*"[4].

The transparency given to the numbers of the school and the methods of disbursement of funds, offer the possibility of having a clearer perception of the investments made to date, investments that require a lot of work both by government bodies and by school managers who they must draw on these funds. For this reason, every effort, both in the intervention of the existing and in the

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3 Translation in English by N. Lombardini.

4 Translation in English by N. Lombardini.

construction of the new one, must be optimized and directed towards the best possible solution in terms of reducing risks for users and in terms of designing spaces suitable for the new training criteria.
The "*recovery*" of existing school buildings, especially if there are about forty thousand active ones in Italy, should in any case be understood as a virtuous exercise that must involve institutions and professionals in a total way, regardless of the cultural value of the building itself. It is a design action that starts from the necessary in-depth knowledge of the building and constitutes a challenge, since every detail of the existing structure must be analysed, understood, and used compatibly with its formal and construction potential.
Predictions of the social and economic order of the context in which schools, also as building structures, are, by their nature, strongly rooted are necessary.
Continuous checks and controls of the building are required, to activate a profitable maintenance process.
The construction of new school buildings, as well as the intervention on the existing ones, whether it is a maintenance work or a restoration and conservation work, remains a cultured action, and, for these reasons, strongly rooted in the training and in the role of an architect.

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Type Device Diagram Kit

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The omission of the school typology from Nikolaus Pevsner's book *A History of Building Types*[1] would seem attributable merely to the desire to avoid weighing down the overall appraisal too much, and to finally see the volume in print. Despite this, it is an exclusion which leaves much bafflement, in view of the presence of such (frankly) marginal types as the hotel building. And it is equally baffling because of the role played historically by Pevsner in affirming the ideals of the Modern Movement. After all, as Canella recalled in his editorial for Issue 17 of "Hinterland"[2] – dedicated entirely to the school – if ever there had been a field in which the modern movement had somehow won its battle in support of a lingua franca, one not tainted by formal exhibitionism or regional refluxes, it was precisely that of school architecture, and Roth's book is there to testify to just this in an exemplary way.[3]

Consequently, it must be that a history of the school typology is one which is anything but linear and, if we did not wish to see that particular activity, equally divided in turn between teaching and learning, as coincident with the mass schooling induced by the Industrial Revolution, then we might easily find ourselves dealing with an activity capable of adapting to multiple spatial situations. Put another way, the transmission of knowledge, whether experiential or abstract, establishes contingent relationships with places and spaces, by adapting to different situations, and has been so for a great deal of our history. If a trade used to be picked up mainly by attending workshops, the children of the ruling classes received the knowledge they needed directly at home, through tutors and institutors.

Only from the end of the eighteenth century was the school recognized as a device, or rather as a part of a device, whose architectural features, no different

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1 Pevsner, Nikolaus. 1976. *A History of Building Types*. London: Thames and Hudson.

2 Canella, Guido. 1981. "Scuola e paesaggio: un'occasione perduta?". *Hinterland*, no. 17 (March): 2-3.

3 Roth, Alfred. 1950. *The New School / Das Neue Schulhaus / La Nouvelle École.* Zurich: Girsberger.

than those of other buildings, announced the ways in which the new society organized time and space in accordance with the logic of capitalist enterprise.
It is therefore easy to recognize that the classroom-corridor paradigm was geared to the internal logic of capitalism, at least as regards the ways in which it operated at the outset. The literacy process was instrumental to the development of workers capable of inserting themselves within increasingly diversified and complex production processes, but this insertion was forced to take place in accordance with the position assigned. Hence, in terms of distribution, there was zero difference between barracks, prisons and schools; for these reasons, the dialectic between the distribution spaces and the units for learning – or care or control – remained virtually unchanged, as did the relationships of these units to communal and outdoor spaces.
Even the typological acme of this address, the panoptic, where the maximization of control and selection is brought to a paroxysm, applies indifferently and with results not too dissimilar, to prisoners, the ill, and young children.[4] Suffice it to think of the idea for a hospital that Antoine Petit published in his *Mémoire*, later espoused by Poyet for his new Hôtel-Dieu project (1785). However, also the field of education was not exempt from such experiments following a line which ran from the London Mechanics Institute (1825), through the re-education of Wandsworth House to the first urban school in Turin (1829), to finally reach certain cornerstones of modernism such as the ring plan school for the Rush City Reformed or Duiker's open-air school (both from 1928).
The term *device*, which of course comes from Foucault, is not related solely to the architectural configuration, but, by a more generic extension, concerns the network established between lectures, knowledge, institutions, and administrative regulations. In short, it is a heterogeneous whole which acts on different areas in accordance with a strategy which intervenes in the balance of forces of a society, driving them in a certain direction.[5]
Remembering therefore that every pedagogical project is historically determined and therefore not alien to a project of society, which in turn is linked to what

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4 Rosenau, Helen. 1970. *Social purpose in architecture. Paris and London Compared, 1760-1800*. London: Studio Vista.

5 Agamben, Giorgio. 2006. *Che cos'è un dispositivo?*. Milan: Nottetempo, Milan 2006.

would once have been called "relations of production", seems far from pointless, especially today in the face of a narrative in which any change strong enough to impose itself is uncompromisingly hailed as "progressive".

If, therefore, innovation and progress coincide, it is only by satisfying the demands for educational and pedagogical updating that, in a renewed alliance between pedagogy and architecture, the school of the future, and therefore the citizen of tomorrow, can be born. After all, it remains a device, with the desire to hold together the different levels of a discourse while calling a spade a spade. And the new device focuses precisely on overcoming the paradigm underlying the previous one, namely, that of the "classroom-corridor". Samuele Borri of INDIRE wrote the same in no uncertain terms: *The classroom is broken*; but also Beate Weyland and Sandy Attia[6] indicated the spaces of the classroom and corridor as the most amenable places on which to act in a vision of a widespread learning environment. And yet, we must wonder, is this liberation of classrooms in a seamless space of continuous learning, where sociability, play, and instruction intertwine and overlap, not geared to that logic of accumulation which proposed to overcome the twentieth-century division of labour by making the boundaries between production and consumption porous?[7] Why should the school present itself today as a sector unrelated to the pressures of the device? As if the desired building renovation were exclusively an expression of pedagogical updating, an adaptation of architectural structures for the sole purpose of the happiness of the child, of the student, according to a narrative not mirrored by contiguous areas, in which instead it is easy to recognize the consistency with which the New World has imposed its choices: from welfare, to health, to the policy of

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6 Wyland, Beate, and Sandy Attia. 2015. *Progettare scuole. Tra pedagogia e architettura*. Milan: Guerini Scientifica.

7 A few years ago, in the wake of the Berlinguer reform, and in the face of the abandonment of the industrial fabric and production being offshored, Lucio Russo described the transition from the old model of high school to the new one like the transition from a school whose task was primarily to select technicians and managers for the purposes of production, to a school which instead should spark consumption, given that "the new kind of concentrated and automated production requires more knowledge from its customers than from its employees." This coincided, in terms of educational content, with the transition from a conceptual, problematic approach to a prescriptive one. See Russo, Lucio. 1998. *Segmenti e bastoncini. Dove sta andando la scuola?*. Milan: Feltrinelli.

welcoming migratory flows.[8]

At this point, let us bracket the links between the educational programme and the economic basis of society and also the ideological nature of the narratives: it is rather the insistence on marrying pedagogical renewal and new spatiality which hints at how the configuration logic of schools tends to be based on a functional rather than typological basis.

This is a key point. Whoever possesses a minimum of notions related to the architectural type knows very well that type and function do not necessarily coincide, that functions with their distributive demands are deft at adapting to the types left behind by history: the countless monasteries and convents converted into schools and lycées continue to bear witness to this; and yet it is precisely this enduringness of the scholastic function, but also one might say educational, in short, which "solidifies" around certain types – suffice it to think of the converse of theatre where even the most radical experiments are basically attributable, by affirmation or contradiction, to a small number of archetypes – to induce a shift from the typological to the diagrammatic level, something already evident in the examples of the Modern Movement.

When I speak of a *diagrammatic* plan I mean one in which the division of the spaces and their organization follows schemes and diagrams of a merely functional order, the configuration of which is decided primarily by the correspondence to the social and educational project. Arguably, for no other activity is there such an extensive use of the diagram as a tool to subdivide spaces and environments. It is pedagogy itself which translates educational relationships into diagrams through which to substantiate their development in space.

It is clear that proceeding by aggregative models, or relational diagrams, is an entirely internal process, independent of that adaptation to the morphological context of which the type is historically the bearer. In itself, a type is not a

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8 It seems to me that the debate, always extremely heated when dealing with the issue of schools, has nonetheless kept its distance from this point: on the one hand by longing for the level of education of the previous educational institution while defending a principle of meritocracy which, in substance, was strictly geared to the division of labour (see by way of example Mastrocola, Paola, and Luca Ricolfi. 2021. *Il Danno Scolastico [School Damage]*. Milan: La Nave di Teseo); on the other, pitting that bourgeois and authoritarian school against the whole democratic tradition, which the major dysfunctions of this device had tried to counteract (especially the volumes which, since 2017, Vanessa Roghi has dedicated for Laterza to Don Milani and De Mauro, Gianni Rodari, and Mario Lodi).

diagram, but the historically determined abstraction of the infinite adaptations that have passed between a production with certain characteristics and contexts that vary over time.
Accordingly, this subtraction from what we might call the *policy,* obtained through the diagram, opens up more significant and profound possibilities of increased participation than cases of participation in the themes of residence, whose typological rigidity greatly limits the degrees of freedom in a participatory sense.
However, it is still a question of defining the language through which such participation might be produced: a language that can allow educators, teachers, administrators and architects to jointly imagine the school of the future.
To bring this participation beyond the level of each client's voiced desires, it is necessary that the requests coming from the world of pedagogy and teachers find a graphic-formal support to transcend the verbal language sphere. Herein, however, lies the crux of the matter, which is also the limit of relational diagrams. When the concept encounters a sign of support, it inevitably begins to work on a formal level as well. In fact, any sign is inclined to establish relationships of a formal nature, and with other signs, regardless of the meaning arbitrarily attributed to it.
As a result, there is a risk that the configurational scheme, resulting from the consultation of different demands, passes directly from the plane of the graphic representation of a dialogical process to the formal one, segueing seamlessly into laboratories, classrooms, and gardens.
The kit for the Neverland School conceived by Beate Weyland and Petra Moog within the LEA research project – a European programme committed to finding coordinated and interdisciplinary answers to the growing need for new schools – is arguably the most accomplished experiment in imagining a linguistic system capable of embracing spatial and pedagogical demands. And yet, despite the fact that the creators of this "board-game" openly declare their desire to steer clear of formal issues, and have no desire to play with architects, the decision to translate into triangles and hexagons a series of relational and didactic concepts typical of a pedagogical project is not without its consequences. Quite simply because the co-binary possibilities of triangles lead to specific aggregative processes, quite different from those of the square or the lozenge. In short, the forms, but

more generally each line, although semantically void and therefore available to temporarily convey some meanings according to an arbitrary and shared choice, nonetheless participate in a system of syntactic relationships. We may agree that a particular point is the world, a child, a tree, a training credit, but the relationship that a point establishes with a line on a surface is not influenced solely by our attributed meanings.

I do wonder then, having ascertained this willingness of forms to assume infinite meanings alongside the impossibility to give of themselves outside a system of formal relations, whether it is not more appropriate to proceed in the opposite direction and prepare a purely formal kit, one of semantically void elements through which to shape social, pedagogical, and formative values that we wish to be the basis of our school. In other words, to oblige the actors involved in the process of designing the new platform to directly use formal language, suitably prepared according to an agreed number of pieces and moves, in order to express the chosen pedagogical profile without intermediation.

Ultimately, the profound meaning of Froebel's gifts is that formal language anticipates the world of meanings, that the verification and trialling of the internal rules of the combinatorial process of volumes, surfaces and colours can do without meanings; meanings which the child can then attribute later on, and also replace and swap according to need or whim.

Bringing the dialogue between pedagogues, educators, administrators, parents and architects to the level of form, by preparing a basic formal vocabulary, does not mean abandoning the role of the architect; far from it, it means putting him/her in a position to deal with the general rules, so that each educational programme can find its own formalization independently. And this is a duly compositional task, since it is necessary to prearrange most of the possibilities of the combinatorial process put in place, the availability of each individual piece to bind with others, to evaluate from the outset the mutual attraction and contrast of the figures that go into the kit, and then the correct balance of special and ordinary pieces as well as their number, since each kit can only be called such if it has a limited number of pieces. The more the kit can shape different pedagogical profiles, responding to different contexts, the more effective it will be.

Above all, it will be necessary to pursue the appropriate level of abstraction through the conception and modularity of the pieces, compelling the actors

involved in the participatory process to personally experience the possibility of the forms to simultaneously satisfy educational and formal relationships, while hindering, through scale, proportions and a certain formal resistance of the imagined pieces, an overly immediate process of signification, whether this be related to the functions involved or to the architectural structures.
In other words, the *pieces* should open up an intermediate space – eminently formal – between the possibility of translating functional quantities into volumetric units and that of mimicking the construction process in miniature. And for this reason the possibility of imagining spaces through both the mass and the surface needs to be left open.
But there is another reason which compels me to consider this experimental sharing of the formal plan more appropriate and fruitful to imagine the schools of the future. Because, without preventing the actors involved from creating a school according to their own educational project, the abstract and limiting nature of the kit hinders mimesis and the revival of all the images and meanings that this conveys, effectively preventing the educational programme from being bound at the outset to pre-established images, which then, in essence, will be images of other schools, other classrooms and other corridors, that is to say, new learning environments.
And the effectiveness of these images in imposing the new school paradigm is beyond doubt. Images are more immediate and know how to be more persuasive. And yet I continue to believe that this concerns education and architecture only superficially, and that both pedagogy and architecture possess, within their own disciplinary tools, the capacity to oppose these dominant narratives with a principle of contradiction to be verified in the concrete realization of cities.

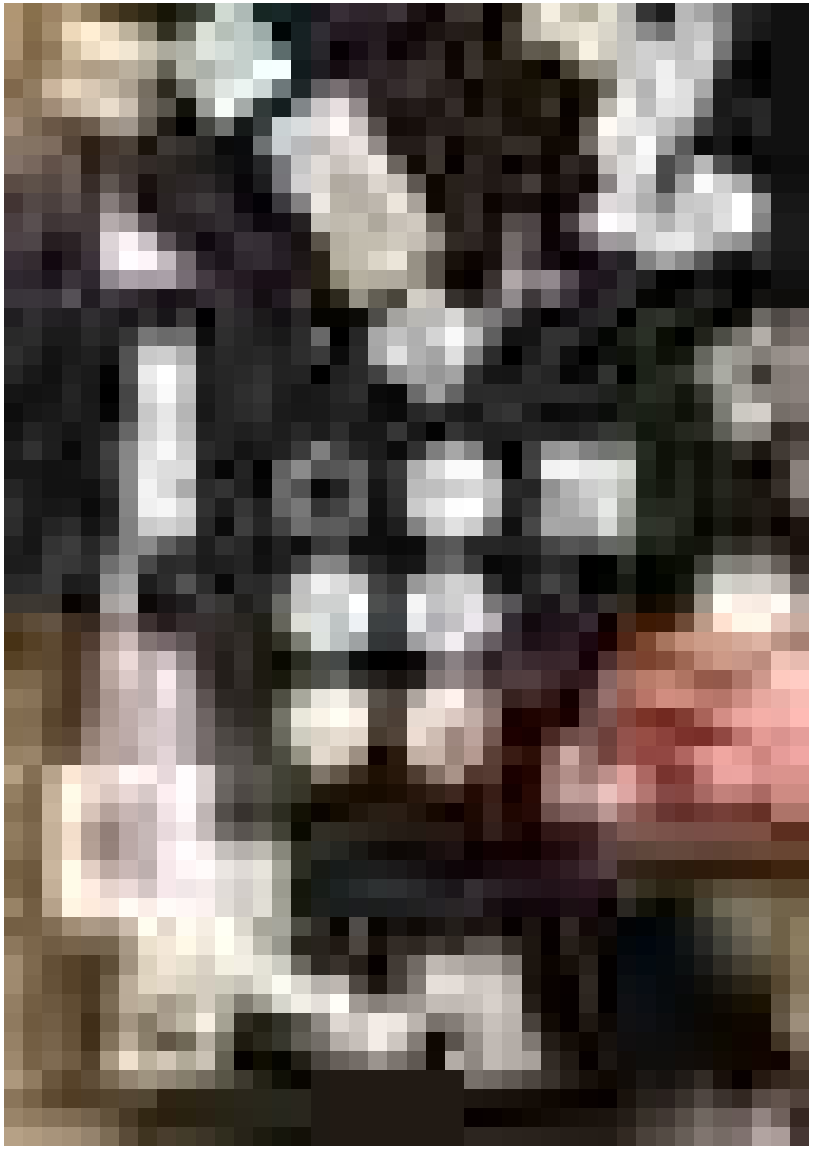

Fig. 1 Frame of the video “La scuola per Ninì: penser avec les mains”, 2022.
Pedagogical-formal kit to imagine kindergartens, developed within the Architectural Design Studio II of the Politecnico di Milano; prof. Elvio Manganaro; tutors: Houssam Mahi, Beatrice Parma, Benedetta Scarano, Caterina Solini; students: Gioanna Buffardeci, Andrea Della Valle, Giordano Cavazza, Arianna Cinciarini, Matilde D’Isanto, Maria Martino; a.y. 2019-20.

Architecture for education

The evolution of Bocconi University and Politecnico di Milano

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Milan International Architectural Design Workshop 2022: an introduction on the topic choice

The urgency of rethinking school construction in Italy is a decades-old issue, calling into question the role of architecture in public service and the management and updating processes for the public building stock, which are often slow, blocked, and unable to respond to the rapid changes in contemporary society and the needs for increasingly diverse and flexible spaces (Belloni and Manganaro 2021). Forgotten some great examples of integration between architecture, education, landscape, and city, taking, for example, the case of the Olivetti kindergarten in Ivrea (Protasoni 2021), today the design of educational spaces appears much more uncertain and problematic. When, with Camillo Magni and the scientific committee, we began thinking about the proposal of design themes for the international workshop MIAW 2022, we immediately identified the school as the issue demanding most urgent attention. Calling on the academic sphere to address issues of such current character may seem a gamble, however, we see this as the prime way to engage with the debates currently underway in Milan and Italy.

Since its origins more than a decade ago, the MIAW workshop has consistently dealt with issues currently in debate in the city of Milan, not so much to propose alternative solutions as to reason with and discuss the choices of the public administrations, and to propose projects – sometimes utopian, sometimes extremely realistic – that free the imagination and fantasy in developing new visions for Milan. The nature of MIAW, with international Visiting Professors leading the different *ateliers*, enables renewed approaches to the national debate, nourished by inputs from very different conditions, processes, and design

cultures. The very first exchanges with the professors involved in the 2022[1] edition immediately brought to light ideas and insights on how to approach the design of the contemporary school, which increasingly signifies a hybrid and innovative space, capable of overcoming rigid divisions and offering useful solutions to original experimentation in design.

In searching for direction for the workshops, we referred to a research project already underway at the Politecnico di Milano, called *Inventing Schools*, coordinated by Barbara Coppetti and Elvio Manganaro in collaboration with the Municipality of Milan, aimed at developing a census of school buildings in the Milan area that need transformation or adaptation with respect to current needs. In proposing cases for MIAW 2022, however, we decided to favour situations where the school buildings would need to be completely rethought, demolishing existing structures, thus affording total freedom to professors and students on the design strategies to be advanced and applied. This current volume collects and illustrates the resulting projects, which articulate and describe the philosophies introduced by the different professors, and their approaches to the complex issue of school building. What emerges is a multifaceted fresco, in which architecture assumes the leading role in a change that we hope will take place in the very near future; where the building is designed to accommodate different activities, and at the same time to build relationships with open space, courtyards, and gardens, which serve as the main places of sharing. What emerges is an aptitude to design and imagine school buildings and on the typologies proper to these spaces that are much more current and practiced by our international colleagues, who brought to bear their experience in projects, studies, and research conducted in various genres on this topic. Among the different experts involved, I would especially like to note Giancarlo Mazzanti and *equipo Mazzanti*, his Colombian studio, and their constant pursuit of research and design on the educational theme, demonstrating how the school is not only a field of experimentation for architecture but also a tool to foster the recovery of neighbourhoods, characterised by social inequalities and poor access to public services.

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1 The 2022 MIAW involved five Visiting Professors: Karin Hofert, Mladen Jadric, Giancarlo Mazzanti, Elsa Prochazka, Mia Roth.

Milan and the adaptation of educational spaces
The case of the Bocconi and Politecnico Campuses of Milan

The ongoing transformations in Milan have involved some educational institutions, but these have mostly concerned the adaption and expansion of university campuses. The MIAW workshops instead focused on primary and secondary public school buildings, and therefore on the years of compulsory[2] education. Over recent decades, the successive state governments have reduced the funding or provided little for new projects to enhance the architecture dedicated to such educational services.

The aim of this essay, however, is to tell the parallel stories of two university campuses, the Bocconi University and the Politecnico di Milano, that have in different forms promoted projects to transform and improve educational architecture, and which we can consider at least partially successful. These are two different stories, but both involving design experiments that have developed effective methodologies and processes for the updating of educational spaces, in rapid time, while also providing significant new urban landmarks.

Iconic, in this respect, is the project for the expansion of Bocconi University, with the recently completed construction of the new campus designed by SANAA studio. This is a large and complex project involving six new buildings that have redesigned the area of the former Centrale del Latte. Bocconi University has pursued an expansion strategy for some time and is not new to operations of this kind. A first piece was the design and construction of a building by Grafton Architects in 2008, representing an early step in the contemporary evolution of a campus that already hosted buildings designed by great architects, first of all, Giuseppe Pagano, and then by protagonists of the Modern Movement, such as Giuseppe Muzio and Ignazio Gardella.

The other interesting example, explored in this short text, is the transformation of the Politecnico di Milano Campus, still in progress, but in recent years involving numerous projects in both the Città Studi and Bovisa campuses.

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2 In Italy, attendance in education is compulsory for at least 10 years, covering the ages of 6 to 16 years. The educational system provides a first cycle of elementary or primary school, from ages 6 to 11, and a second cycle called “first level secondary education”.

The projects implemented on the two campuses of the Politecnico di Milano are different in nature and address various themes. However, both cases take valid approaches in adapting traditional campuses, proceeding through specific projects that integrate and maintain what exists. Another interesting aspect is that of the processuality and technical actions to accelerate operations that would normally take a much longer long time to be completed. It appears useful to study both the architectural and procedural choices that enabled innovations within an institution as complex and rooted as the Politecnico di Milano.

The two cases show abilities in understanding how the needs of current education demand both spatial-architectural and functional updating of spaces. Both the Bocconi and Politecnico cases recount the realities of universities projected toward tomorrow, with the courage and strength sufficient to imagine the near future of university education.

The Bocconi Campus: a precious catalogue of architecture for education

The history of Bocconi University is a "beautiful story" as Marco De Michelis says (De Michelis 2021; 8) in the introduction to the volume "*The growing city: the new Bocconi campus in Milan*": a book that not only documents the most recent construction – the campus extension by SANAA, inaugurated in 2021 – but also traces a complex history beginning as far back as 1937, with the foundation of the private university by Ferdinando Bocconi and the commissioning of Giuseppe Pagano for the building design. The Bocconi campus designed by Pagano rose in a suburban area, still on the city periphery, where the architect designed a building inspired by the Bauhaus headquarters of Walter Gropius, constructed in 1925. As we can see, the story begins many years ago, and then never ceases.

Subsequent expansions were designed by Giuseppe Muzio and Ignazio Gardella, then more recently by Yvonne Farrell and Shelly McNamara, of the Irish firm Grafton Architects. The story here is one of the development of a beautiful university campus, where the qualities of the individual projects blend and complement one another, even without an initial unified design. The latest episode in this transformation, at this point lasting more than half a century, is the campus expansion designed by the Japanese firm SANAA, founded by

Kazuyo Sejima and Ryue Nishizawa, in the area of the former Centrale del Latte. For the second time following the selection of Grafton Architects in 2008, the University resorted to the instrument of the invited international competition, in this case for the transformation of the former Centrale del Latte. The strategy was successful: among a dozen proposals[3], the SANAA project emerged the winner, doubtless in consideration of the radical approach to the urban condition of the site, but also in large part for the typological and spatial innovation in conceiving the spaces dedicated to training, teaching and education; "[the project] is an independent object that slips into the block's geometries", said Camillo Magni in the article for Casabella examining the completed SANAA project (Magni 2021, 73). The project for the Bocconi Campus can be further understood by reading Pippo Ciorra's essay *"Introduction to SANAA"*[4]. Ciorra interprets the few education projects completed by Kazuyo Sejima and his studio demonstrating their links with the domestic architecture of the home, which even though not usually considered, remains at the core of Japanese design experimentation. Ciorra expresses the fundamental aspects of SANAA's design poetics and explores the significance of certain design and material choices, above all the relationships between the humans, space, and transparency, central to the architecture of Sejima and Nishizawa, and within which the person assumes a key role. "The first [aspect] is the presence of the building's inhabitants. Human figures catch our eye and miraculously make the transparency turn into space" (Ciorra 2021, 28).

The design choices involved in the Bocconi campus can also be read and understood through comparison with two other projects emblematic of the work of SANAA on educational spaces: the Rolex Learning Center in the campus of Ecole Polytechnique Fédérale de Lausanne, completed in 2010, and the Grace Farms River Building, completed in 2015 in New Canaan, Connecticut. Both are buildings which, in different forms, subvert traditional educational typology

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3 The studios selected for participation in "*Campus Urbano: International Competition*" were: OMA - Rem Koolhaas; David Chipperfield Architects; Massimiliano and Doriana Fuksas; Mario Cucinella (MCA); Cino Zucchi (CZA); Miralles Tagliabue (EMBT); Sauerbruch Hutton; Morphosis; SANAA; Odile Decq and finally Jean Nouvel, who chose not to submit a proposal.

4 The competition process is reported in: "*The growing city: the Bocconi campus in Milan*" edited by Marco De Michelis and published by Domus.

and embark on new ways of understanding such spaces. For SANAA, open spaces of movement and circulation always prevail over the closed and static space of classrooms. Classrooms dissolve and become spaces delineated by the presence of a few chairs or defined by the spontaneous gathering of people around a reader. The different educational and recreational functions of Grace Farms facility seem randomly placed within a transparent and sinuous volume, descending a gentle slope and surrounded by vegetation.

The floor plan of the Rolex Learning Center is almost a diagram (Ito 1996; Corbellini 2007, 42) and the form becomes one with the structure of the building; the inhabited spaces are the corridors, which shed their classically regular and cramped shape and become the protagonists of the design. The voids become patios, sculptural excavations boring through the two curving structural slabs, and spaces accommodating activities so specific as to require separation from the fluid collective space.

In the buildings of the Bocconi Campus, we find the synthesis of these two approaches in a unique and visionary project, interpreting the traditional urban form of Milan in a fresh and original aspect. Sejima and Nishizawa have imagined the university as a large park, a public space in continuity with the nearby Ravizza Park, where people meet, stop, observe and study.

This is an obvious idea for a place intended for education, but too often ignored when opportunities have arisen for innovating the Italian school heritage. Diagrams that explain the overall project and the ground floor plan reveal clearly how, in this approach, the educational activities face onto a series of parks and courtyards, in a manner recalling Milan's dense urban fabric, yet at the same time breaking its compactness through a careful system of transparencies, allowing glimpses of different horizons as the individual moves between the ground floors of the different buildings. The cladding of perforated aluminum sheet modulates and controls the interior transparency, while the sequences of sinuous pathways through the different floors and buildings closely recalls the characteristics of Grace Farms. The sinuosity of the paths and volumes and the skillful development of transparencies fuses public with private space, university with city. Within the Milanese context, SANAA's project is unique for its development of a complex system of spaces using gestures of absolute simplicity.

The Politecnico di Milano campus: design by grafting

Since the 1990s, numerous proposals have been advanced for the transformation and updating of both the Bovisa and Città Studi campuses of Politecnico di Milano[5]. The most emblematic case concerns the area of the so-called "Goccia", with its gasometers. This much-discussed area, abandoned for decades and then the subject of infinite debates and interventions, has still not arrived at a definitive solution. In 1990, the Politecnico faculty themselves took the entire area of the gasometers and Goccia as the subject for the design of a completely new campus. Among the subsequent initiatives, competitions, and calls, the most interesting have been a masterplan for the recovery of the area, designed by OMA in 2007, which won an international competition[6], and also the "*Call for Ideas: A park for research and work at Bovisa*"[7] promoted by the Politecnico di Milano in 2016 (Moro 2017). The latter competition saw numerous professors from different departments of architecture, urban planning, and design submit projects for the transformation of the gasometer area as a campus and research center (Setti 2022, 95).

Given the urgency of adapting existing spaces to new needs, the University has redirected its strategies for the two campuses, in particular through the creation of an internal design group called *Vivi.Polimi.lab.*[8], unceasingly engaged in transformation projects for the two campuses (Biagi and Magni 2022, 23). These have included targeted interventions for the rearrangement of the open

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5 The research on the quality and design of university spaces in Milan, and around the world, has been the subject of an important series of exhibitions held at the Politecnico di Milano during the XXI Triennale in 2016, entitled "Campus Contro Campus. Architetture per studiare e ricercare" which consists of three volumes (Postiglione, Rocca, Bassanelli 2016; Baglione, Dulio, Cozza 2016; Biraghi, Valente 2016).

6 On these events and plans, the reader can refer to the "Bovisa Masterplan" by OMA, 2007, https://www.oma.com/projects/bovisa-masterplan

7 and the *Call for Ideas "Un parco per la ricerca e il lavoro a Bovisa"* . The 2016 Call for Ideas led to the realisation of ten projects, by multidisciplinary working groups from different international departments, for the redevelopment of the Goccia area as a technological and research hub.

8 *Vivi.Polimi.lab* is a working group composed of professors, researchers and research fellows, coordinated by Emilio Faroldi, Vice Rector of the Politecnico with responsibilities for Building, Spaces and Sustainability.

spaces, such as the "Giardini di Leonardo", inaugurated in 2021 in the Città Studi campus, but also far more extensive ones such as Renzo Piano's project for the construction of a new classroom building, and the rearrangement of the open spaces facing the Trifoglio and Nave buildings through a series of additions and subtractions, aimed at street level reconnection and the definition of a large treed space, which in only a few months became the heart of students' and professors' activities (Biagi and Magni 2022, 22).

The strategy adopted by Politecnico di Milano board and Vivi.Polimi.lab is to obtain much faster implementation times through centralisation of project management and control, in some cases also favouring external contributions from *alumni* and well-known external professionals, such as Renzo Piano and Eduardo Souto de Moura, who designed the Domus Politecnica, providing spaces for faculty and students, currently under construction among the historic buildings adjoining Piazza Leonardo da Vinci.

The most recent piece realised by Vivi.Polimi.lab is the building known as "La Collina degli Studenti", or "Students' Hill" on Via La Masa of the Bovisa campus. The building introduces a new topography to the area by creating a landscaped hill, fitting between repurposed warehouses and teaching spaces. The basement, hidden from the view, hosts the warehousing spaces and laboratories of the Department of Mechanical Engineering. The central volume of this linear building features extensive glazing, connecting the interior spaces with the roof terrace and the new hill. This main linear volume terminates at either end in sculptural volumes clad in Corten steel, housing the vertical connections of stairs and elevators.

This new building introduces a visually striking element to the Bovisa flat landscape, generally characterised by the somewhat fragmentary spatial effect of a succession of various warehouses. The building accommodates a study space and meeting rooms, available to students by reservation, as well as spaces for faculty activities. This is an open place, designed for the community, accomplished through the manner of overlooking the new hill and the grand sequence of windows: a public meeting space intended for the community life of students and professors.

The projects for the Bocconi University and the Politecnico di Milano illustrate two different stories in terms of the instruments for project management and the development of design choices, but both evidence the very real possibilities of adapting the existing heritage. In some cases, as at Bocconi, this is done by expanding the current assets with projects of great strength; in other cases through more mediated forms of grafting on, of addition and subtraction, such as in interventions for the Politecnico campuses.

What we are witnessing is a revolution that puts the educational institution – in all its forms – at the centre of the project, and which forces us to think of how to actualise a school heritage that otherwise can no longer support the challenges of contemporaneity. Our hope is that soon we can describe, recount, and visit further new schools, in Milan and in Italy, that describe a new season in the design of educational spaces.

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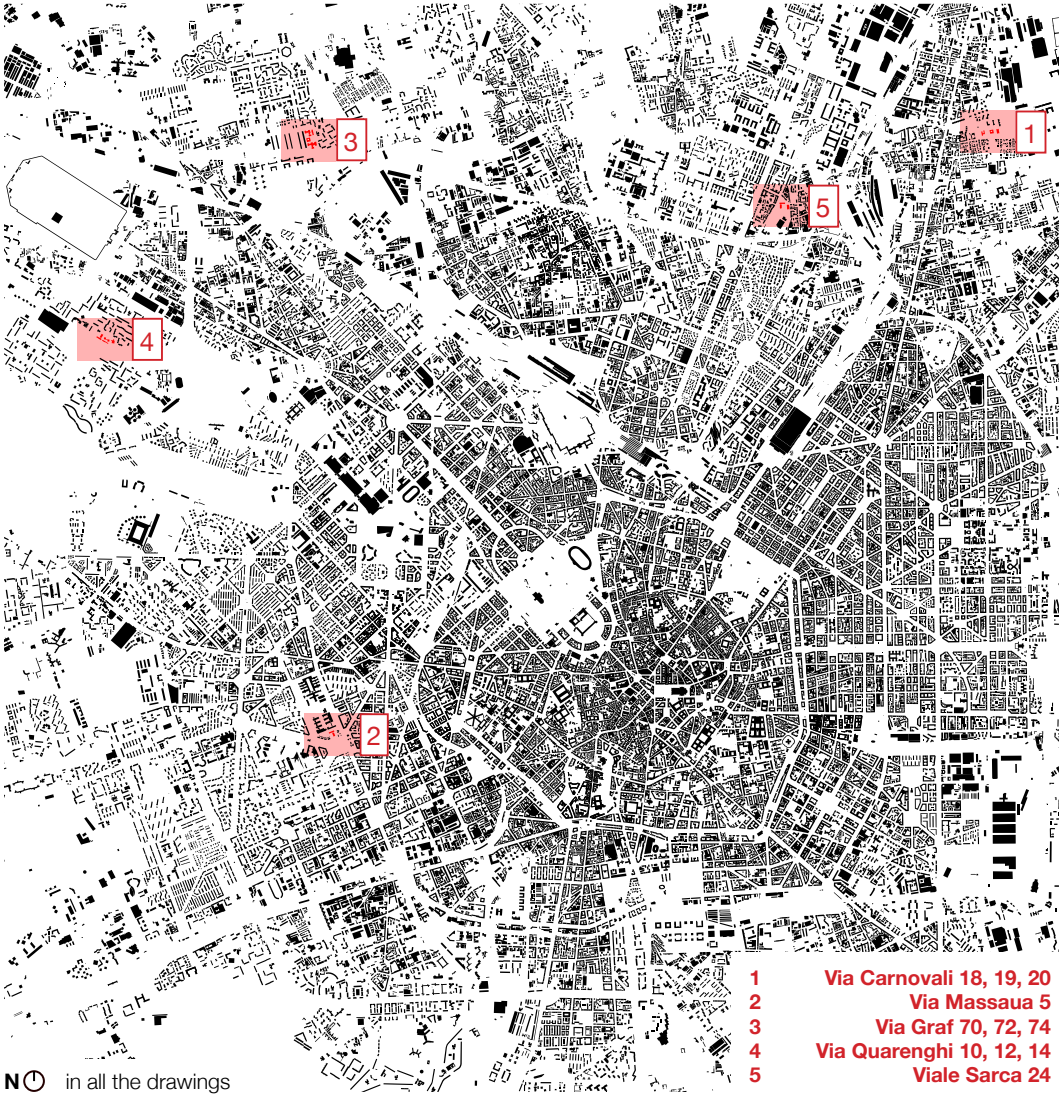
03. PROJECT SITES

Luigiemanuele Amabile, Andrea Foppiani, Riccardo Genta, Francesca Gotti, Michele Porcelluzzi, Yona Catrina Schreyer

Sources:
Comune di Milano, Inventing Schools, Google Earth



1. Via Carnovali

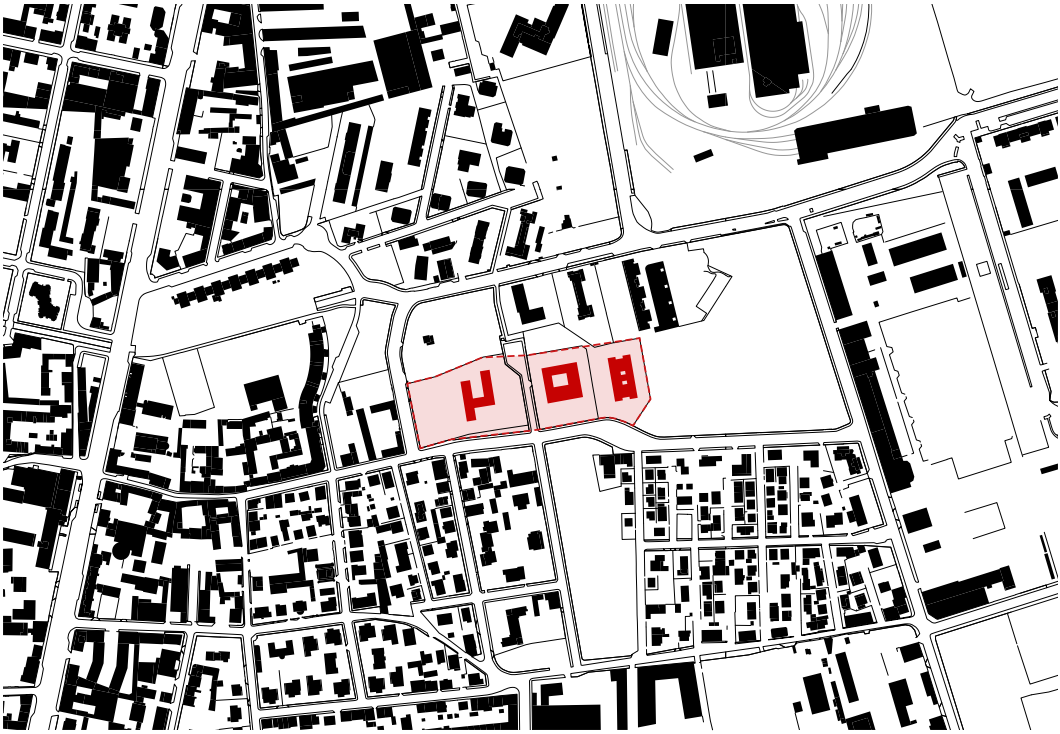
Located in the outer North-eastern area of Milan, Precotto district used to be an autonomous municipality between Milan and the close-by town of Monza. Along with the adjacent Gorla district, Precotto was absorbed by the rapidly growing Milan in 1923, becoming a predominantly residential neighbourhood of the working class. The school area in Via Carnovali is surrounded by a system of urban parks (such as Parco Maddalena, Parco di Cataldo, Parco Bazzani) and several outside sport areas, favouring the establishment of an integrative school design for Precotto.

Functional Program:

Nursery: n° 4 classrooms (33 sqm each), n° 4 resting/sleeping areas (22 sqm each), n° 4 rooms for special needs (45 sqm each)

Kindergarten: n° 5 classrooms (50 sqm each), n° 1 rooms for special needs (100 sqm each), n° 1 playroom (100 sqm each)

Primary School: n° 10 classrooms (50 sqm each), n° 1 multimedia room (150 sqm), n° 1 small library (100 sqm), n° 3 dining halls (41 sqm each), n°1 large garden (no gymnasium)

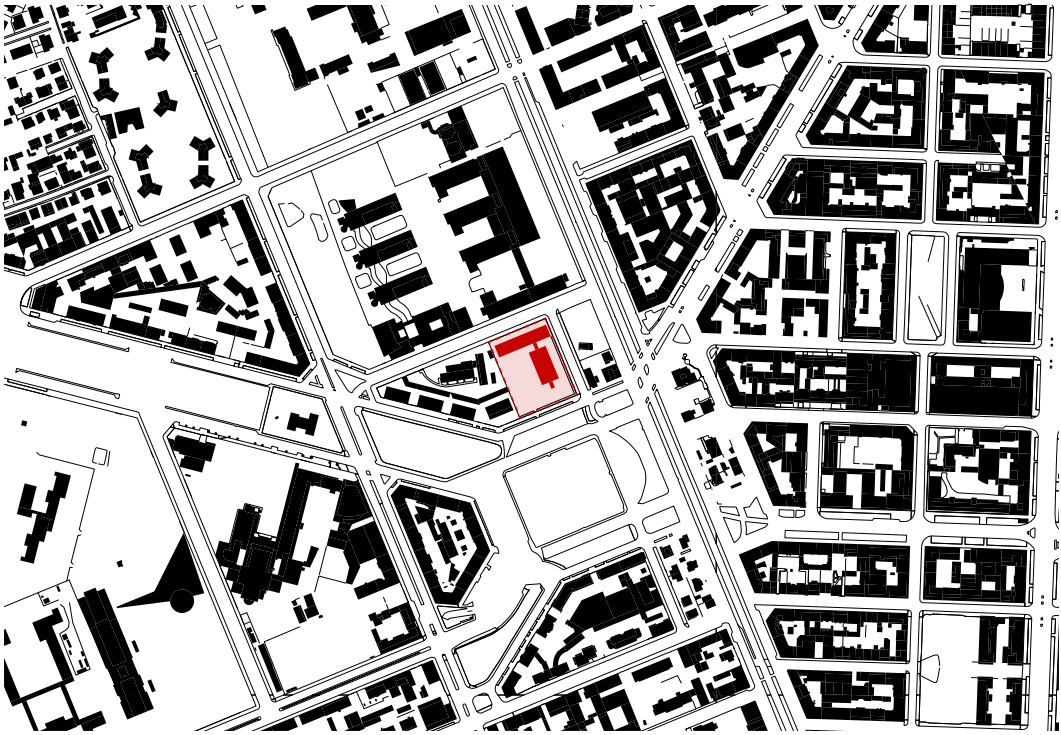


2. Via Massaua

Arzaga district was established in South-eastern part of Milan during the 1960s as a middle-class residential neighbourhood near Porta Vercellina, soon after the former Arzaga Farmhouse had been demolished. In the following decades, many families of Iranian descent settled in the area together with a large Jewish community, which is present up until today. Architecturally, the area is marked by mansions and private gardens of considerable size, as well as many public green spaces. The school campus is located right next to one of these green spaces, Piazzale Tripoli.

Functional Program:

Primary school: n°24 classrooms (50 sqm each);
1 classroom for special needs (100 sqm);
1 gymnasium (500 sqm)



3. Via Graf

Quarto Oggiaro district was constructed between the 1940s and 1950s in the Northwestern area of Milan, becoming home to many working-class families that migrated to Milan from the South of Italy. Following an urban development scheme for social housing, the constructive developments were undertaken by single developers and thus bear the signs of specific design pattern which makes the single housing projects clearly distinguishable. The school campus is part of the “Aldini II – Le case di Via Graf and De Pisis” plan. As the area consisted exclusively of social housing, the social and economic integration of the new residents became a challenge which could be remedied only in a slow process and influences the neighbourhood up until today.

Functional Program:

Kindergarten: n° 5 classrooms (50 sqm each), n° 1 sleeping area (150 sqm), n° 1 playroom (100 sqm), garden

Primary school: n° 24 classrooms (50 sqm each), n° 1 dining hall (300 sqm), n° 1 gym + fitness room (500 sqm)

Secondary School (Level I): n° 24 classrooms (50 sqm each), n° 8 rooms for special needs/laboratories (100 sqm each), auditorium/cinema/ theatre (360 sqm), n° 2 computer rooms (100 sqm each)

4. Via Quarenghi

Lampugnano, in the North-western parts of Milan, is a predominantly residential area that is located in the midst of three decisive urban development projects. Two of them were established during the second half of the 20th century, namely QT8 (8th edition of Architectural Triennale Milano) and Gallaratese. The adjacent Portello fair area on the other hand belongs to the more recent urban transformation projects in Milan that also includes the CityLife area. As of today, the neighbourhood hosts around one fifth of all Milanese immigrants and includes a considerable number of public gardens, one of the most important ones is situated right next to the project area in Via Quarenghi.

Functional Program:

Primary School: n° 5 classrooms (50 sqm each), n° 1 playroom (100 sqm)

Secondary School (Montessori): n° 24 classrooms (50 sqm each), n° 1 gymnasium (500 sqm)

Secondary School: n° 24 classrooms (50sqm each), n° 4 classrooms for special needs (200 sqm each), n° 1 gymnasium (500 sqm)

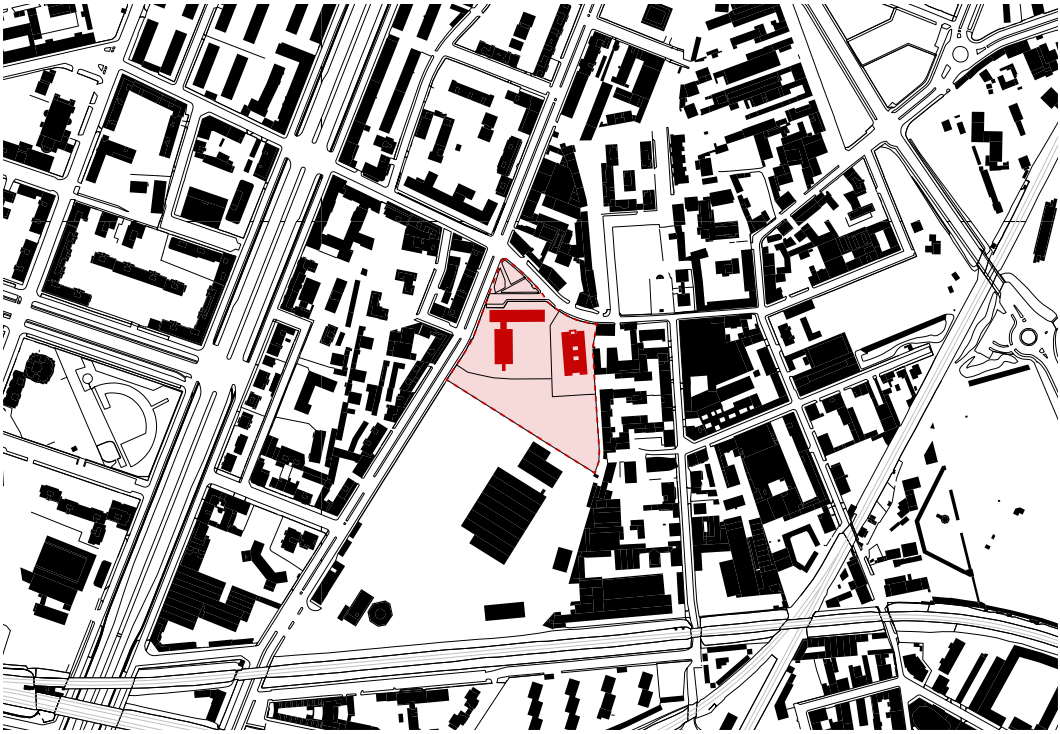
5. Viale Sarca

“La Bicocca” was the heart of the industrialization process in the North of Milan together with the adjacent neighbourhoods of Greco and Sesto San Giovanni. Back then, Bicocca hosted some of the most important Milanese economic players, among them Pirelli, Ansaldo, and Breda, and consequently was marked by factory buildings as well as housing for the workers. As the industrial business was gradually pushed out of the city, Bicocca was subject to a significant urban transformation process, called “Grande Bicocca”. The area today is home to both private and public venues, such as the University of Milan-Bicocca, the Teatro degli Arcimboldi, the exhibition spaces of Hangar Bicocca, and Bicocca Village. Part of the post-industrial redevelopment after the 1980’s was the establishment of urban public green areas.

Functional Program:

Kindergarten: n° 5 classrooms (50 sqm each), n° 1 rooms for special needs (100 sqm each), n° 1 playroom (100 sqm each)

Secondary School: n° 24 classrooms (50sqm each), n° 4 classrooms for special needs (200sqm each), n° 1 small gymnasium (360 square metres), n° 1 big gymnasium (500 square metres)



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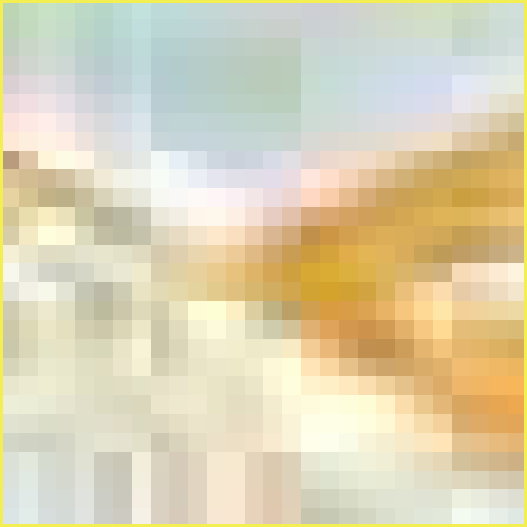
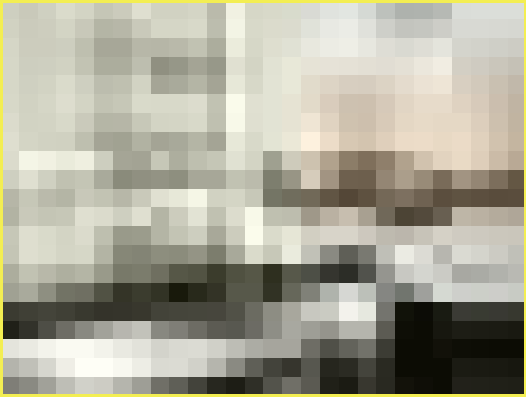
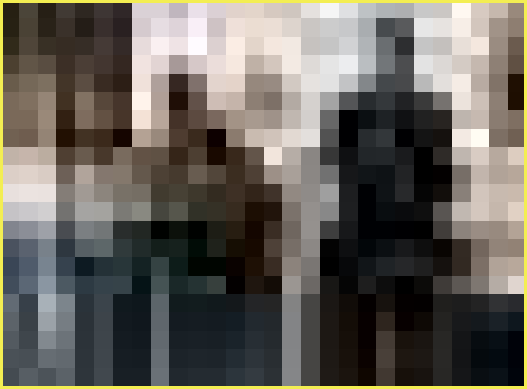
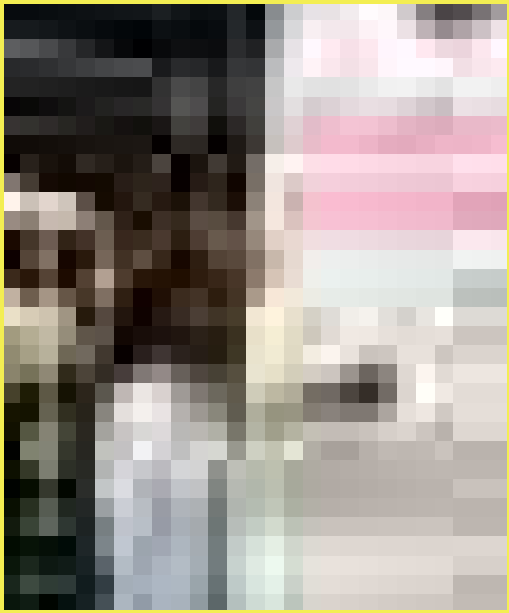
Throughout Europe, the social and organisational discussion about the school system has gained momentum.
The Politecnico Milano and the city of Milan are taking up this discussion: in an international workshop at five selected locations with different urban structures, questions are being asked about current developments and at the same time possible answers are being analysed, discussed, conceived and planned on the basis of urban planning concepts and building type interpretations.
In the process, the urban integration related to the specific site situations should be analysed in particular and become a constituent part of the architecture.
The local integration should be a starting point for the considerations, the places should not be hermetically but openly assigned to the respective district, as permeable as possible and as bivalent as possible to the public and the institution of education.
Education should not be viewed exclusively in terms of schools, but as a whole in terms of society, how children and young people can best find their way in their future with the support of the institution and the public: they should at the same time not only experience and acquire contemporary contents, but also behavioural patterns that do not end with their time at school, but must be constantly developed further. For this purpose, the architectural and spatial offer is of great importance.
The “hardware” of the different school typologies was developed and designed at the 5 given locations according to the defined needs, continuously discussed and evaluated, so that finally very different solution patterns and results with convincing answers could be presented in an improvised exhibition.

Schools are still floating...

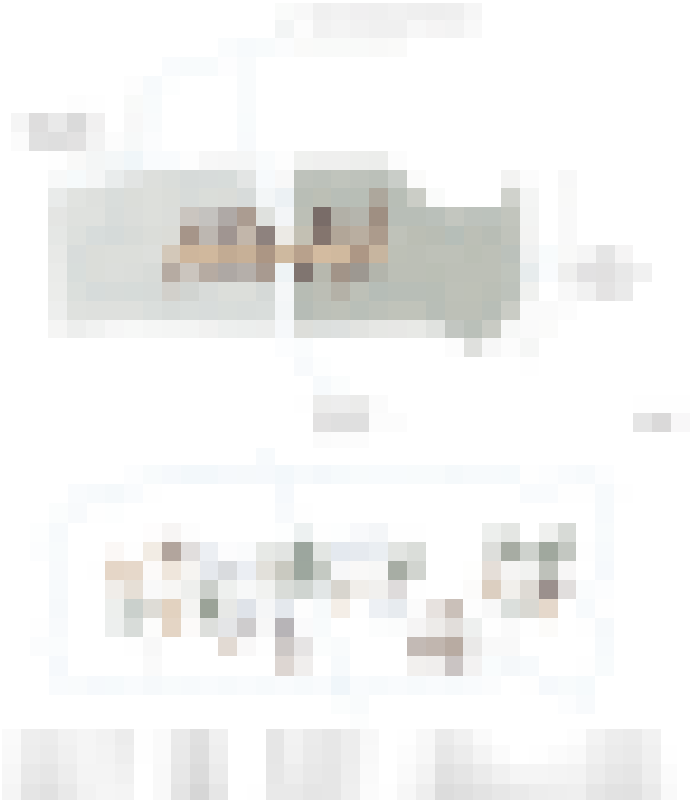








Group 1. Learning with Nature (via Carnovali) | First impressions of the area, individuation of critical points and potentialities

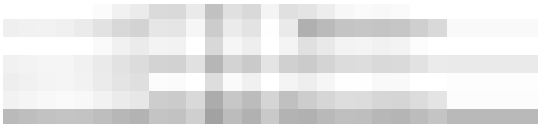


Group 1. Learning with Nature (via Carnovali) | Study concept and diagram of uses

Group 1. Learning with Nature (via Carnovali) | External perspective from the garden towards the school

Group 1. Learning with Nature (via Carnovali) | Masterplan. The school within the urban gardens

Group 1. Learning with Nature (via Carnovali) | Ground Floor Plan



Group 1. Learning with Nature (via Carnovali) | Section AA showing the folded roofs

Group 1. Learning with Nature (via Carnovali) | Section BB

Group 1. Learning with Nature (via Carnovali) | Perspective view from the main entrance square, hosting a weekly market

Group 1. Learning with Nature (via Carnovali) | Perspective view from the urban gardens surrounding the school and hosting didactic activies for children

Group 1. Learning with Nature (via Carnovali) | Axonometric view

Group 1. Learning with Nature (via Carnovali) | View from the urban front, showing the walking path along the school

Group 2. A City within the City (via Massaua) | Perspective view of the school court/urban plaza

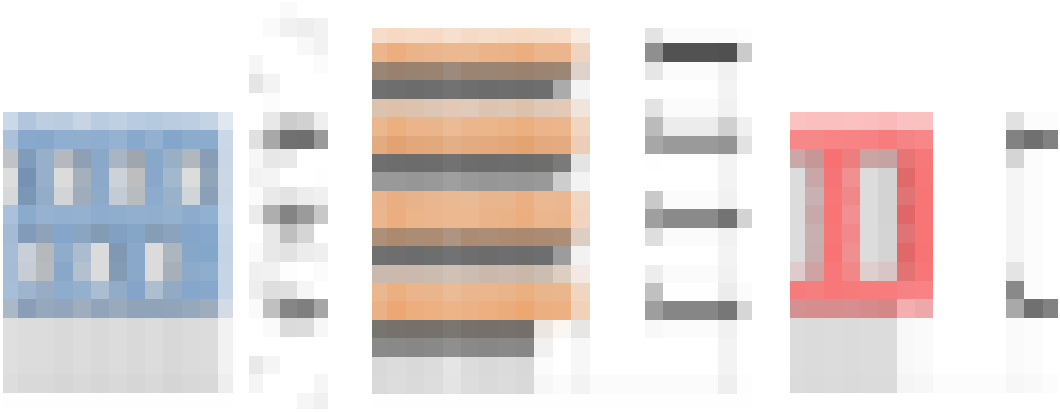
Group 2. A City within the City (via Massaua) | Perspective view of the entrance of the Kindergarten

Group 2. A City within the City (via Massaua) | Ground Floor Plan

Group 2. A City within the City (via Massaua) | Perspective view of the interior passages to the school court

Group 2. A City within the City (via Massaua) | Perspective view of the open community spaces within the school buildings

Group 2. A City within the City (via Massaua) | Section AA, BB and CC showing different heights of the school buildings

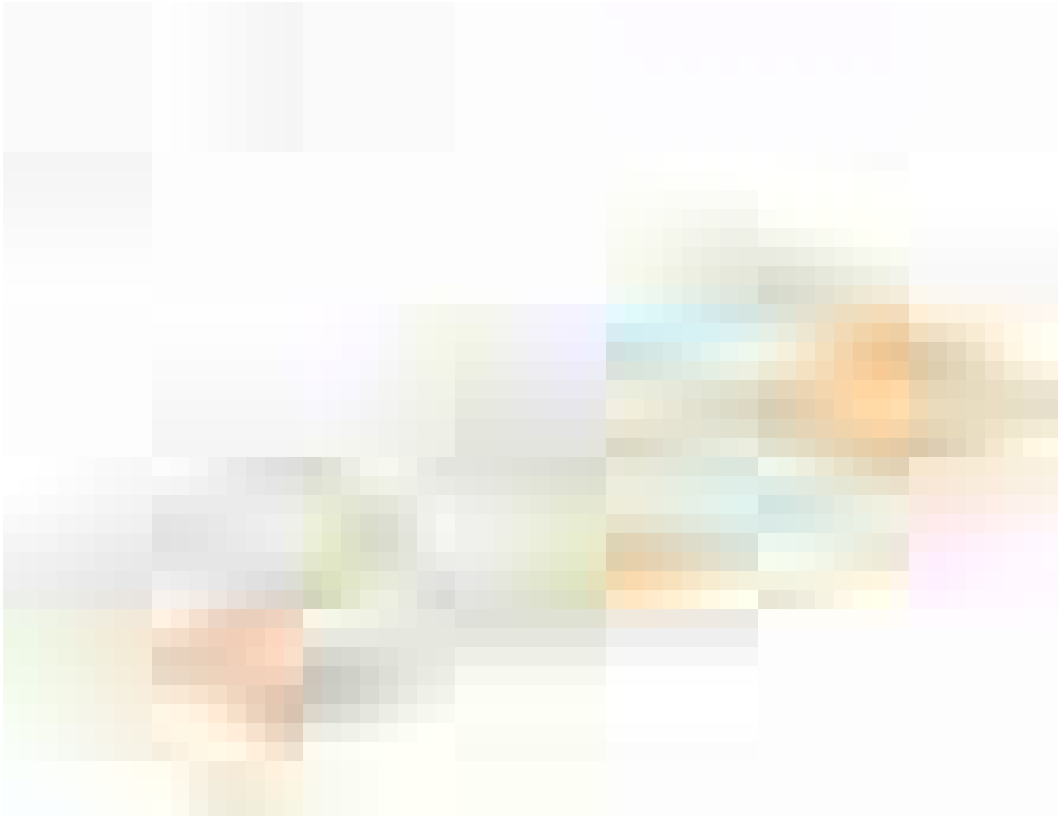


Group 2. A City within the City (via Massaua) | Facade details. Reinterpretation of Milanese klinker

Group 3. Urban Island (via Graf) | Ground Floor Plan

Group 3. Urban Island (via Graf) | Perspective view of the interior shared space

Group 3. Urban Island (via Graf) | Perspective view of the urban passage among multipurpose classrooms



Group 3. Urban Island (via Graf) | Axonometric view

Group 3. Urban Island (via Graf) | Pesperctive view of the main front

Group 4. Extendend School (via Quarenghi) | Concept Phases. From the empty site to the school connecting city and green spaces

Group 4. Extendend School (via Quarenghi) | Masterplan. The school extending into the new green park

Group 5. Tracing Narratives (viale Sarca) | Masterplan and perspective section. The school creates a new landscape for children

Group 5. Tracing Narratives (viale Sarca) | "The Yellow Baloon". Creating an architectural narrative through the spaces of the school

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Mat(h)building

Dispositions • Combinations • Permutations

Since we were asked to design several school complexes with various functional programs in areas with different urban and social backgrounds, the main didactic concern was to identify a design method flexible and adaptable enough to be applied to heterogeneous and diverse contexts.

Therefore additionally to the three T's – *topos*/site, *tipos*/use, *teknos*/construction – that condition and inspire any project, we added another constriction to put the project quickly on track: a strategy that more than aiming a formal definition works as a system.

Mat-buildings start from a basic unit that is linked in clusters growing to stems and even to grids. The concept is particularly adequate for building programs dealing with bunches of repetitive modules – like classrooms – and contains the possibility of adapting to changing needs. Understanding this methodology as a set of principles that regulate an “everlasting” work-in-progress makes it absolutely convenient for scholar buildings.
A module that has to link properly to others usually starts from geometrical standardized portions that can build up different sizes of modules. Therefore the special schoolrooms with much bigger dimensions like gyms or theaters can also become multiples of the same system, unless they are used as exceptional counterparts to underline the systematicity of the proposed structure.
If the modular system of basic-unit-clusters extends in horizontal (groundscraper like) it leads directly to the concept of alveolus. The pattern of built and void defines a rich building section with a well-perforated fifth façade. A one or two-floors-volume sprinkled

by enclosed unroofed spaces or courtyards makes perfect sense for school buildings.
The alternation of full and void or solid and empty asks for graduation of the limits, for successive thresholds leading from in-in to out-out. An assembled sequential pattern always contains the notion of the intermediate space. What better place for not conducted or non-formal learning – as important as the regulated one – than in-between spaces?

The students, working in groups of three or four, were given five possible basic units and ways to relate them, that is, five aggregation strategies:

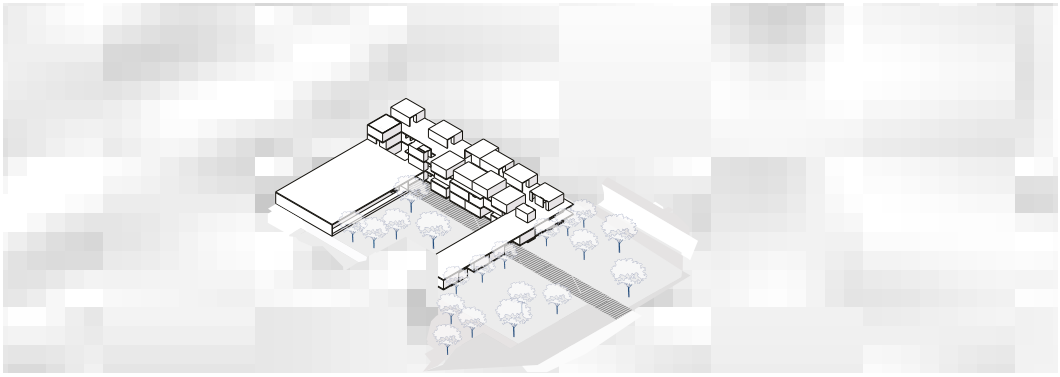
- ATTACHED BOXES
- DETACHED MODULES
- SPATIAL GRID
- VAULT
- UMBRELLA or TREE

They had to profile these units (shape, size, etc.), give them a feasible material and structural definition, and check possible clusters. Once the system seemed to work in terms of basic use, they were asked to test it on two different plots. Adapting and considering slight variations contributed to clarify units and aggregation systems and to understand better the identity of each site. The comparison of different systems working with the same program on the same site resulted of great didactic value.
The special schoolrooms were placed in a way to make them easily accessible for the neighborhood, often helping to define borders and entrances to the school grounds and extending the grounds to the city.

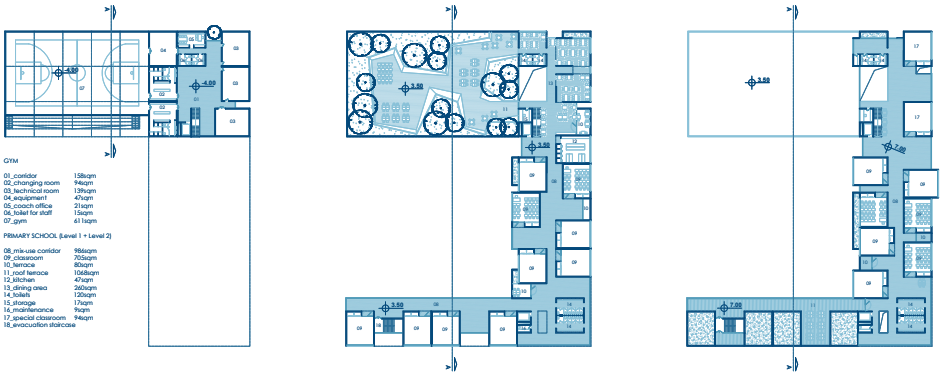
We paid special attention to exterior and interior limits, to thresholds and in-between spaces, to patios and courtyards, to light and vegetation.

To understand reality in its three dimensions from the very beginning we worked with sections and immediately with physical models. At the end every group, in addition to six boards, produced two 1:500 models, one for each plot, and a 1:200 model to explain the unit, the way of assembling it, the cluster and the intermediate spaces. Asking each students group to apply its specific aggregation strategy on two of the five given sites resulted in sixteen masterplans. The variety of valuable outputs proves that the chosen aggregation strategies are flexible and adapt well to any context.

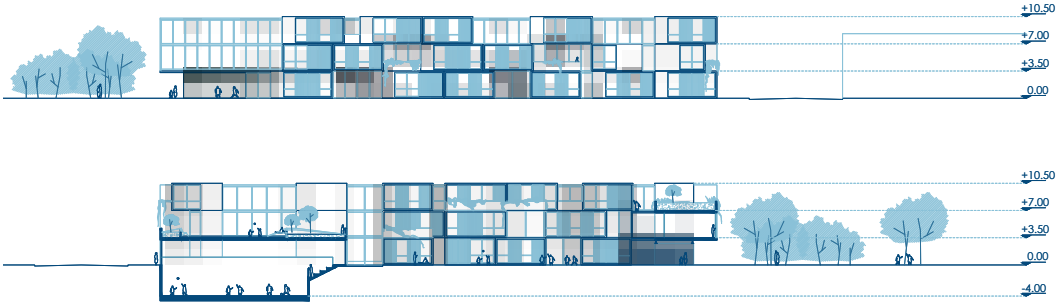
Hopefully both the strategies and the resulting catalogue of case-studies can be of use for Milano municipality.



ATTACHED BOXES | "Pop-out" by M.De Roia, N.Jeremic, M.Benvenuti | via Massaua, axonometrical view



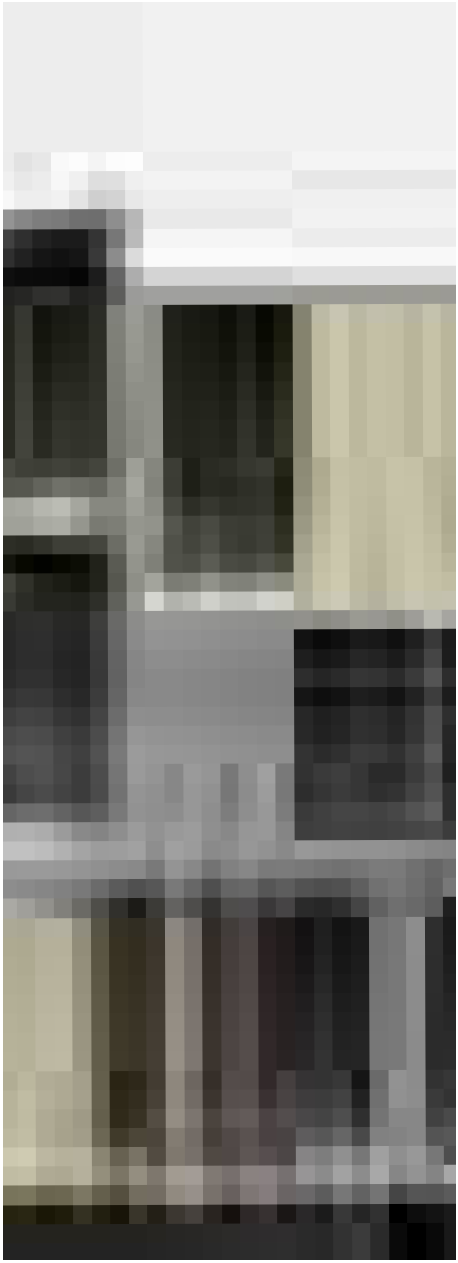
ATTACHED BOXES | "Pop-out" by M.De Roia, N.Jeremic, M.Benvenuti | via Massaua, floor plans



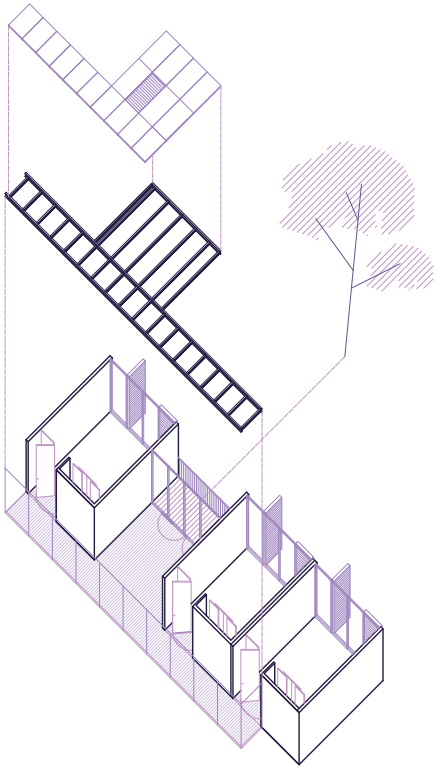
ATTACHED BOXES | "Pop-out" by M.De Roia, N.Jeremic, M.Benvenuti | via Massaua, East elevation and section A-A

ATTACHED BOXES | "Pop-out" by M.De Roia, N.Jeremic, M.Benvenuti | via Massaua, perspective view

ATTACHED BOXES | "Pop-out" by M.De Roia, N.Jeremic, M.Benvenuti | via Massaua, scale 1:500 model



ATTACHED BOXES | "Pop-out" by M.De Roia, N.Jeremic, M.Benvenuti | via Massaua, scale 1:200 model detail



ATTACHED BOXES | "Pop-out" by M.De Roia, N.Jeremic, M.Benvenuti | modular unit's exploded axonometry

ATTACHED BOXES | "Branches" by A.Pautova, J.Li, S.B.Rasool | via Graf, axonometrical view

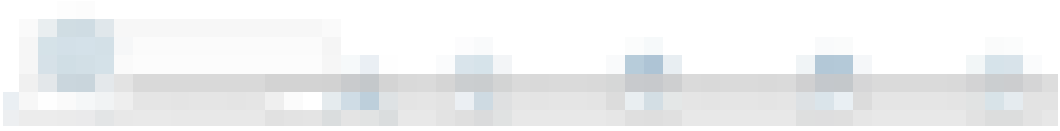
ATTACHED BOXES | "Branches" by A.Pautova, J.Li, S.B.Rasool | Via Quarenghi, axonometrical view

ATTACHED BOXES | "Branches" by A.Pautova, J.Li, S.B.Rasool | Via Quarenghi, ground floor plan

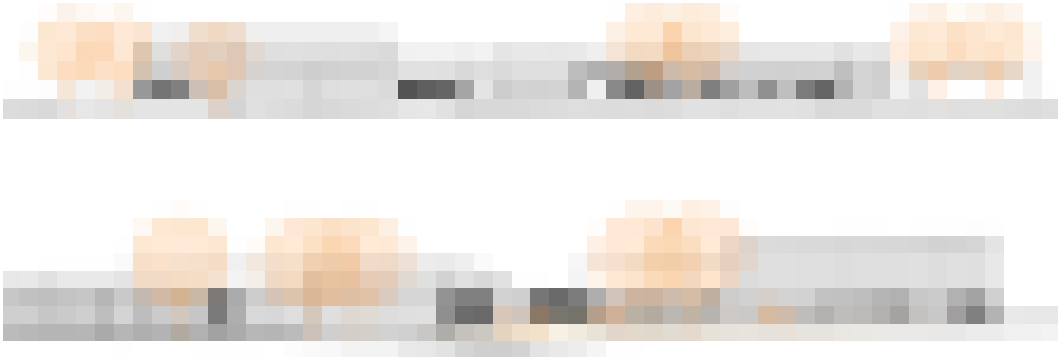
ATTACHED BOXES | "Branches" by A.Pautova, J.Li, S.B.Rasool | via Graf, perspective view

DETACHED MODULES | "In-Between" by O.Leoni, K.S.Anthony, N.Medic | via Massaua, perspective view

DETACHED MODULES | "In-Between" by O.Leoni, K.S.Anthony, N.Medic | via Massaua, axonometrical view



DETACHED MODULES | "In-Between" by O.Leoni, K.S.Anthony, N.Medic | via Massaua, North-East elevation and section



DETACHED MODULES | "In-Between" by O.Leoni, K.S.Anthony, N.Medic | viale Sarca, perspective views

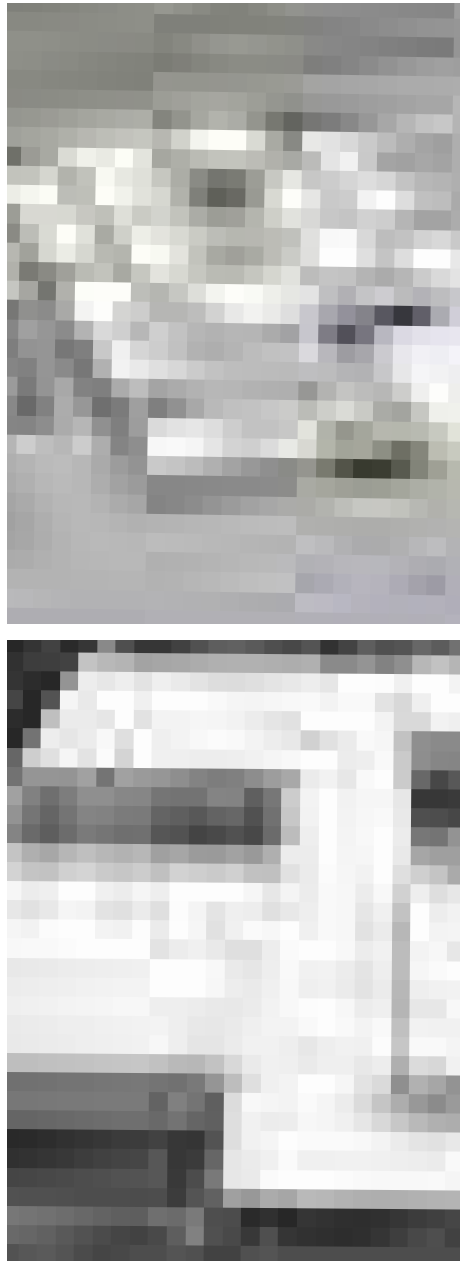
DETACHED MODULES | "In-Between" by O.Leoni, K.S.Anthony, N.Medic | viale Sarca, axonometrical view

DETACHED MODULES | "In-Between" by O.Leoni, K.S.Anthony, N.Medic | viale Sarca, North elevation and section

DETACHED MODULES | "In-Between" by O.Leoni, K.S.Anthony, N.Medic | via Massaua, exploded axonometry

DETACHED MODULES | "In-Between" by O.Leoni, K.S.Anthony, N.Medic | viale Sarca, exploded axonometry

DETACHED MODULES | "In-Between" by O.Leoni, K.S.Anthony, N.Medic | modular exploded axonometry



DETACHED MODULES | "In-Between" by O.Leoni, K.S.Anthony, N.Medic | scale 1:500 and 1:200 models

DETACHED MODULES | "DiaGrid" by E.Guerzoni, K.E.Kavakli, R.Wang, X.Liu | via Carnovali, axonometrical view

DETACHED MODULES | "DiaGrid" by E.Guerzoni, K.E.Kavakli, R.Wang, X.Liu | via Quarenghi, axonometrical view

DETACHED MODULES | "DiaGrid" by E.Guerzoni, K.E.Kavakli, R.Wang, X.Liu | via Carnovali, roof plan

DETACHED MODULES | "DiaGrid" by E.Guerzoni, K.E.Kavakli, R.Wang, X.Liu | via Quarenghi, roof plan

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Five strategies

In the context of an endeavor in systemic redefinition of school space, testing universally applicable models was explored. They look at what contemporary educational space brings to children, parents, neighborhoods, the city. How can a school become a didactic tool in itself, how can it contribute to framing and connecting communities, how can it reciprocate the needs of contemporary society? The workshop developed from an aim to answer these questions in five strategies, focusing on one dominant theme but including elements of the others. The strategies employed several common premises: liberating the pedestrian ground floor, connecting the school to the trajectories of neighborhoods, including the school grounds into the city's green infrastructure, imprinting the pedagogic idea onto not only the classroom but also the in-between space, the threshold of school and community.

Over the course of the workshop, the introductory analyses were complemented by a sequence of readers and talks which looked into predecessors of innovative educational spaces which gave a physical imprint of a pedagogic or social idea, beginning with the reform pedagogies of the early 20th century, to recent experiments in reformulating spaces for early, primary and secondary education, aiming to arrive at possible directions of future educational space. Each strategy has an added program extending the school's relevance to the communities it serves. After introductory analyses of the locations, a strategy was matched to them to fully reciprocate the location's needs and test the model. Particular emphasis was given on the specific context of each location, subsequently

tailoring each strategy to its specific morphology, social and demographic context, projections and possible futures.

- The (kinder)garden school + urban farming_Learning from the open-air education movement and its profound impact on the pavilion school, this strategy explores a contemporary look into the didactic, climactic and educational aspect of revisiting outdoor education. Drawing on Friedrich Froebel original kindergarten as a space where children grow and are themselves grown, it examines the value of direct contact with nature and extends this concept to engage the neighborhood_Site: Via Carnovali 18, 19, 20_Group 1 (Ronzullo Marco Alessio, Prajith Pradeep Kumar, Dayannara Giler, Eduardo Gámez)

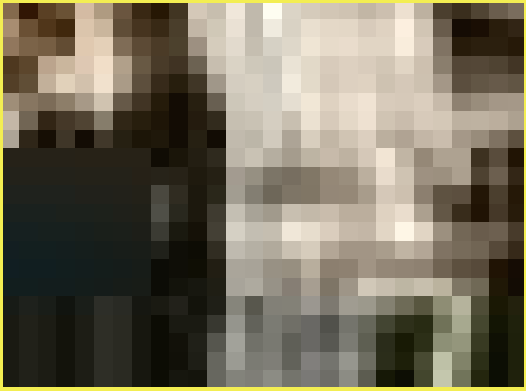
- The didactic stack + public condenser_How can a school become a dense communal space, without compromising its protected functional regime? How can it extend its role of a social focal point, placing the agenda of bringing together diverse communities on an equal level to its educational program? Learning from dense educational environments with maximum urban impact, it takes cues from Meyer&Wittwer's Basel century-old school project and looks into contemporary examples of stacked social programs producing a charged identity. Site: Via Graf 70, 72, 74_ Group 2 (Cosmin-Andi Dumitru, Mia El Khazen, Winona Golenja Hoic, Mia-Maria Mistou)

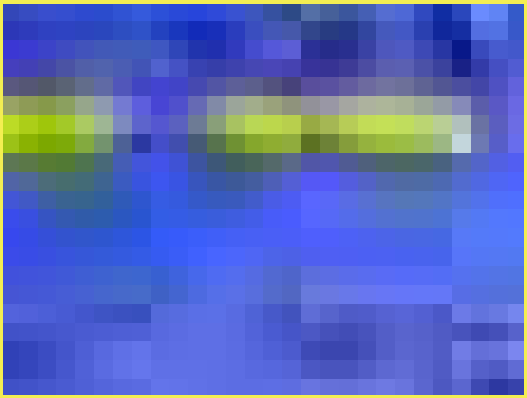
- The communal school + extended learning_Taking an explicit approach to the capacity of a school to be appropriated in various scales and by various users, the strategy examines school space grown around its thresholds and built around its possible polyvalent uses. It embraces children, families and neighborhoods in a structuralist pattern of organic growth, extending the school's

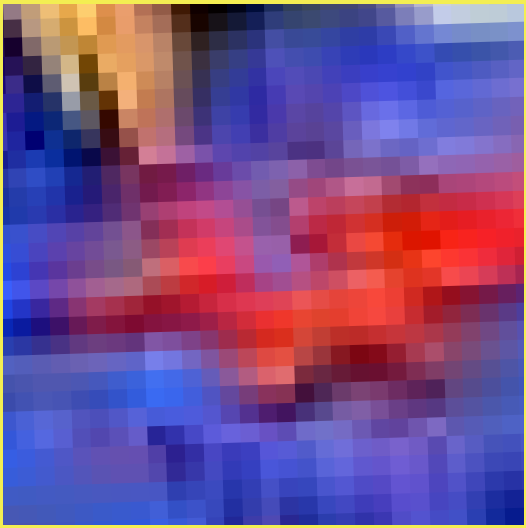
agenda to include workshops, extended learning, and inclusive inhabiting. It looks into possible symbioses with elements of the surrounding urban tissue, dispersing related programs in the school's vicinity_Site: Viale Sarca, 24_Group 3
(Guillermo Pérez-Banuet Farell, Fernanda Arriaga Navarro, Gayane Patvakanyan, Jan Jakub Szonert)

- The laboratory school + startups and makers_Revisiting John Dewey and translating the concept of learning by doing into the school's gravitational zone, this approach proposes a strategy bringing together communities in laboratories, fostering contemporary maker culture, using it both as a didactic tool as well as a draw for community engagement. It implies a systemic, modular approach to educational space, making its transformation into a continuous workshop enabled by infrastructure. It also implies an accessible and fluid ground level to allow different users to permeate the complex. Site: Via Massaua, 5_ Group 4
(Merve Sertogullarindan, Li Yue, Wu Siqi)

- The school system + neighborhood pedagogy_Relating a pedagogical idea which is reflected in the classroom, it extends an analogous relationship to the neighborhood, expanding it into an overarching interpretation of a 'prepared environment'. A systemic, organic process of growth is implied, creating a place of multiple negotiable spaces, of a spatial interaction carried out by its users, of an environment of co-design. To enable this, the school functions as a mechanism open to interpretation both by students and the neighborhood alike_Site: Via Quarenghi 10, 12, 14_Group 5
(Jelena Bosnjak, Ana Jurisic, Martina Edda Chiappe)







Group 1 (Kinder)garden school + urban farming | Site Masterplan

Group 1 (Kinder)garden school + urban farming | Project plan

Group 1 (Kinder)garden school + urban farming | Detail section

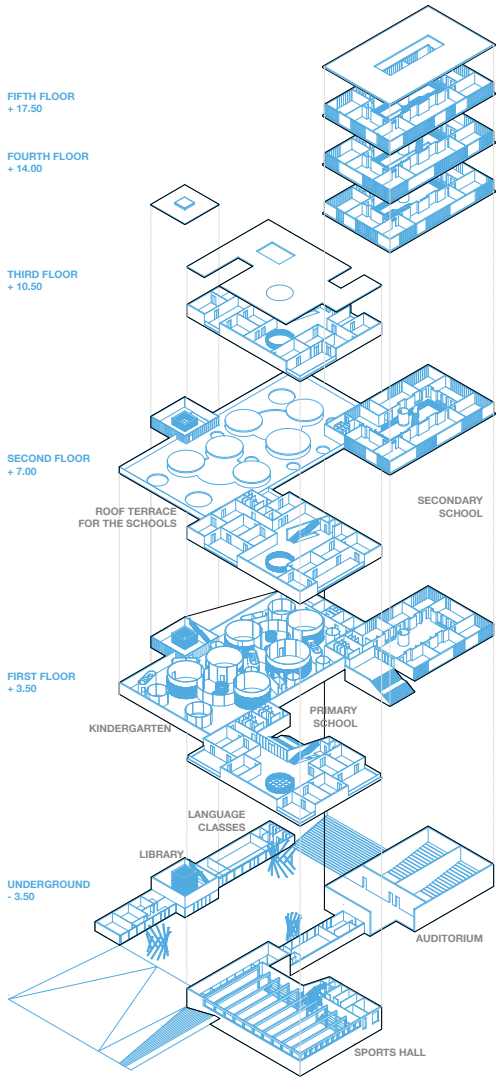
Group 1 (Kinder)garden school + urban farming | Space development diagrams

Group 1 (Kinder)garden school + urban farming | Detail Plan

Group 1 (Kinder)garden school + urban farming | Renderings

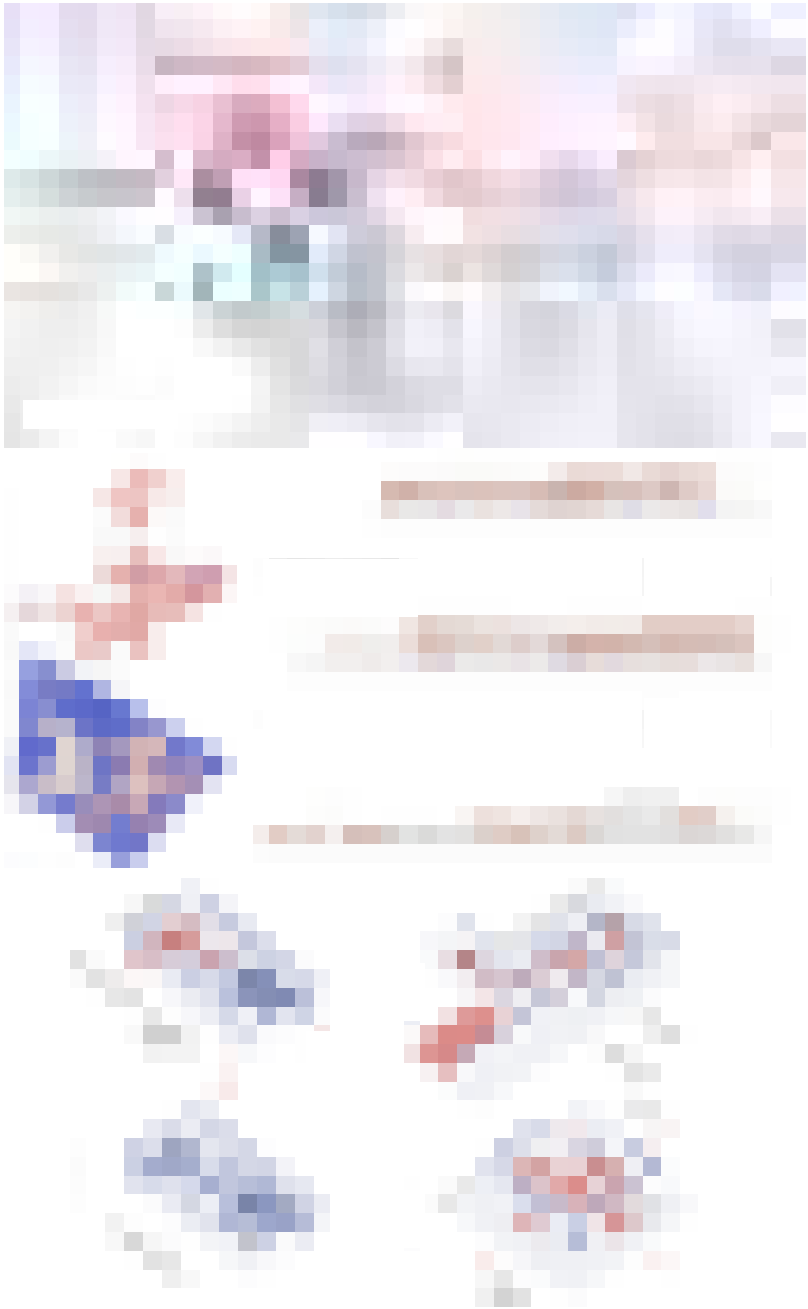
Group 2 The didactic stack + public condenser | Site masterplan

Group 2 The didactic stack + public condenser | Project plans

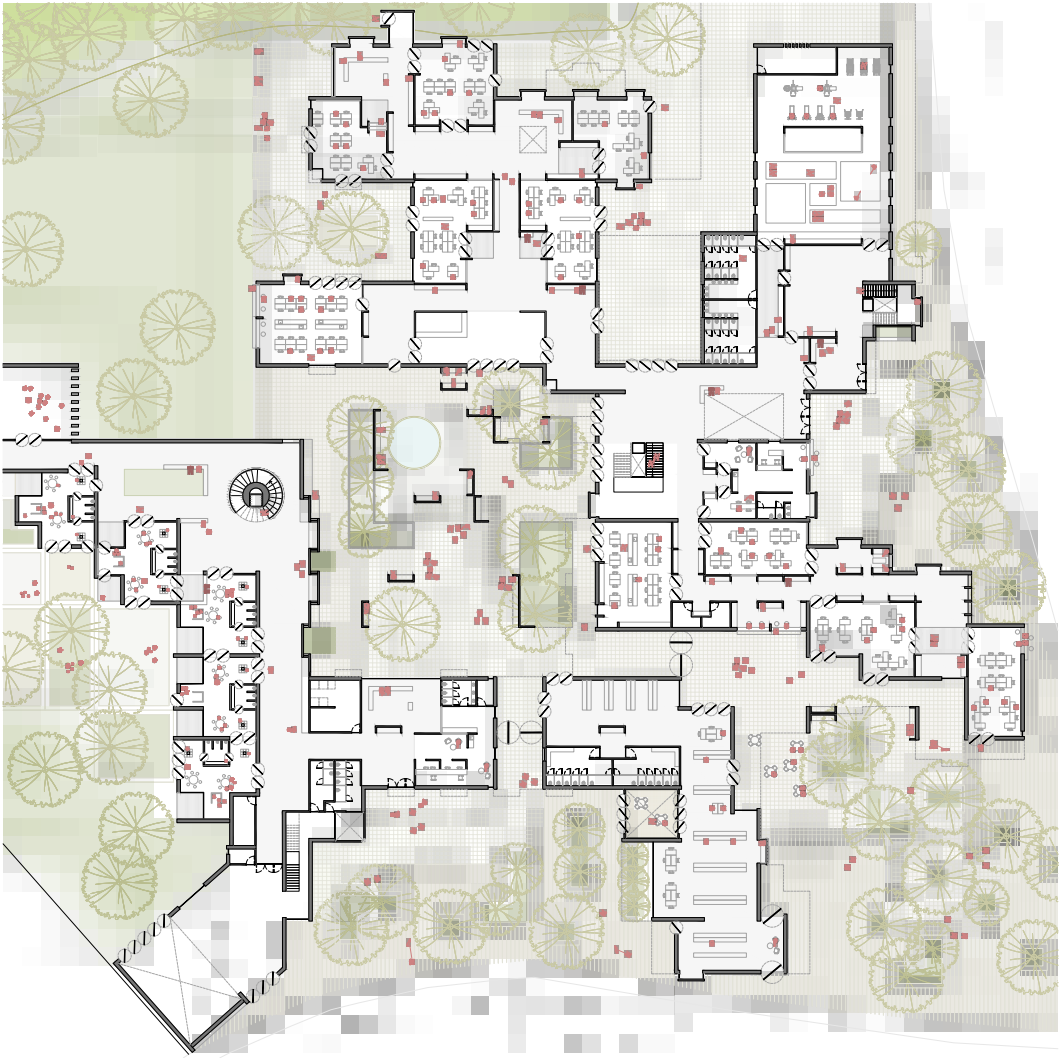


Group 2 The didactic stack + public condenser | Classroom detail plan and exploded axonometry

Group 2 The didactic stack + public condenser | Renderings



Group 3 The communal school + extended learning | Masterplan, elevations and classroom diagrams



Group 3 The communal school + extended learning | Groundfloor plan detail

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Tutor: Yona Catrina Schreyer

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Roniya Roy
Muhammad Kadhan Ruskanda
Ahmed Musa Saeed Aymen
Sudharsan Natraj Sivapiran
Kristina Susa
Mustafa Alparslan Turan

The Space As Third Teacher

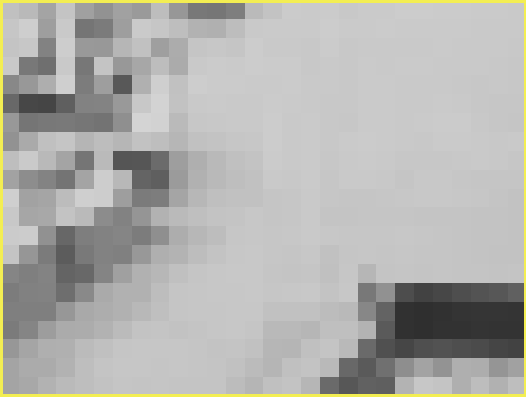
Loris Malaguzzi, one of the founders of the “Reggio pedagogy”, understood very early on that we must recognize the educational space as a “third teacher”. In recent years, the most significant improvement in the school sector has occurred since World War II. Built examples show a profound change in the dominant typologies: contemporary models are based on concepts like the cluster model and open-space concepts and replace the previous system of corridors and classrooms. The keywords we introduced to the new vocabulary include the terms like inclusion, flexible space, cluster-school, participation expertise, inclusion, etc. We can observe two major innovations: the participation and involvement of users in the planning process and the training of teaching staff, which prepares them for interactive work in innovative learning environments. Clusters usually consist of a few educational spaces of different sizes grouped around a common, shared space. Like a fractal form, the entire school building is generally composed of several such units, which in turn are oriented towards a common center, which is bigger in scale. The central core is often designed as a seating landscape and is used for events and informal learning. A contemporary school building allows us to use and create different learning arrangements either via mobile elements and furniture or through long-term adaptability to new, unforeseeable requirements. The schools seek cooperation with local educational and cultural institutions. Public spaces become increasingly involved in formal or informal educational spaces and can be shaped as such.

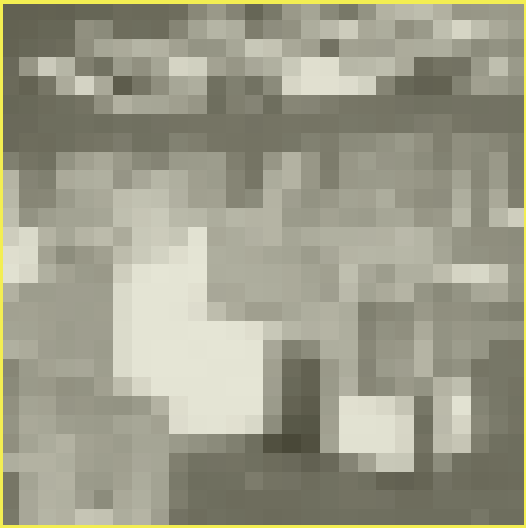
Comparison
To obtain optimal solutions, the five teams were able to choose only two sites. By systematically comparing concepts with the general aim of drawing an empirical conclusion, they were able to create an optimal program formulation. We also consulted PISA experiences and examined suggestions drawn from international comparisons and evaluations of school quality as a source of inspiration and support.

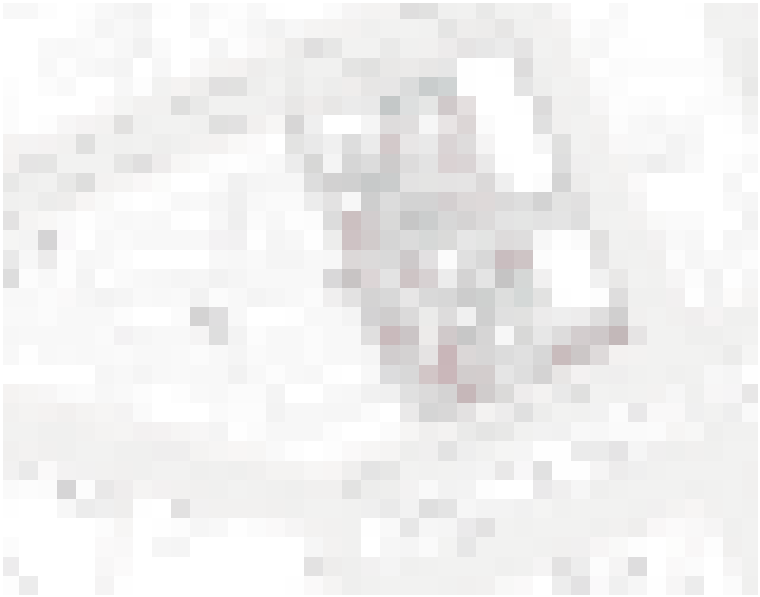
Collective Form*
An essential part of the conducted research was the experience of discourse, meaning, and formal expression of the so-called Collective form. We shared the ambition to improve our design and enable a built environment to shape children's behavior and fundamentally influence the development of their social-political values. Ethical implications were an integral part of the discourse about the “collective” form and thus essential for contemporary pedagogy and the goal of the common good. Our ambition went toward putting ethics before aesthetic values and still lending the collective form an appropriate, three-dimensional expression. The design of the corresponding spaces required a frame for permanent renewal, adaptability of the elements on their scale, and the possibility of expansion (growth). The real challenge was to solve the complex, multi-layered connection between individual learning spaces and the entire environment and the large-scale integration of the future school into the whole district. Giuseppina Pizzigoni emphasized constant renewal through experimentation and work. Children as individuals must be treated with respect. Building a better world is only possible with our participation in spaces that allow us to realize our creative potential, which is the source of all renewal.

Collective Design
All team projects for the new school were developed according to the “collective design” principle and through collective research work with colleagues and visiting professors from MIAW 2022. They owe their quality and vitality to collaboration among large interdisciplinary and multinational planning teams and experts. Here, I would like to thank all of them explicitly for our fruitful cooperation.

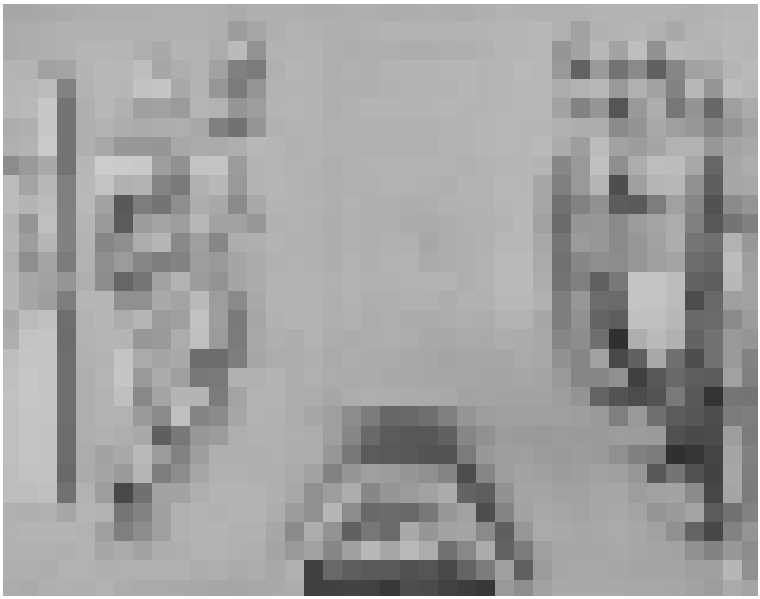
** Fumihiko Maki published Investigations in Collective Form in 1964 and reflected on theories of collectivity after fifty years of practice.*







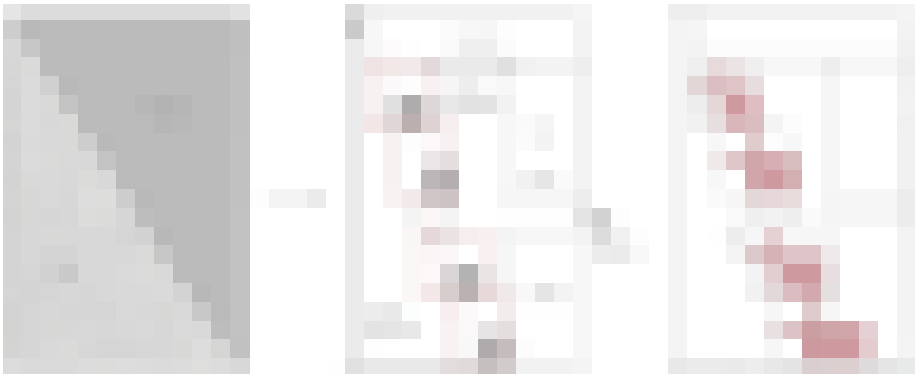
Group 1 | Urban Scale Model



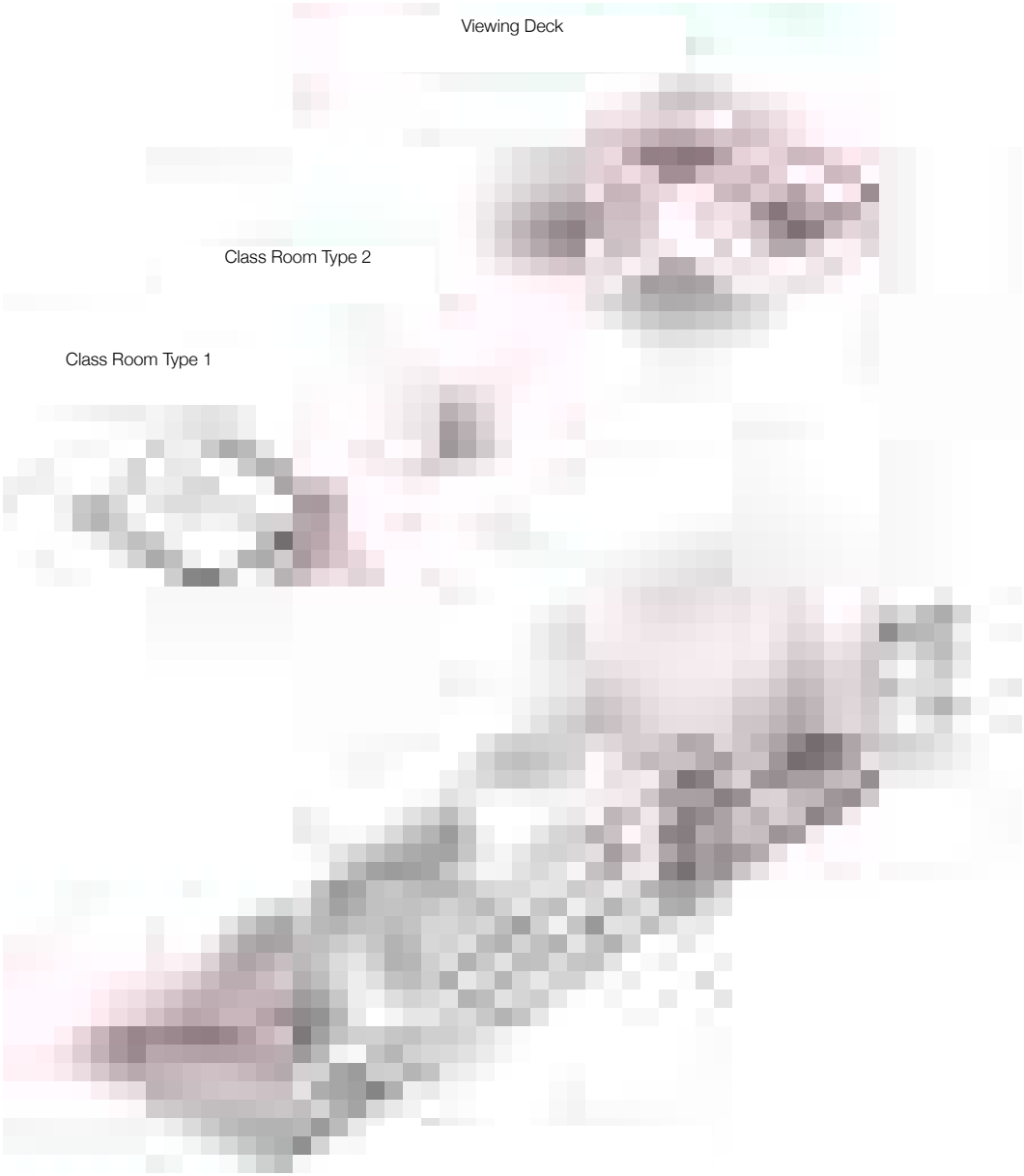
Group 1 | Urban Scale Model

Group 1 | Atmospheric Sketches

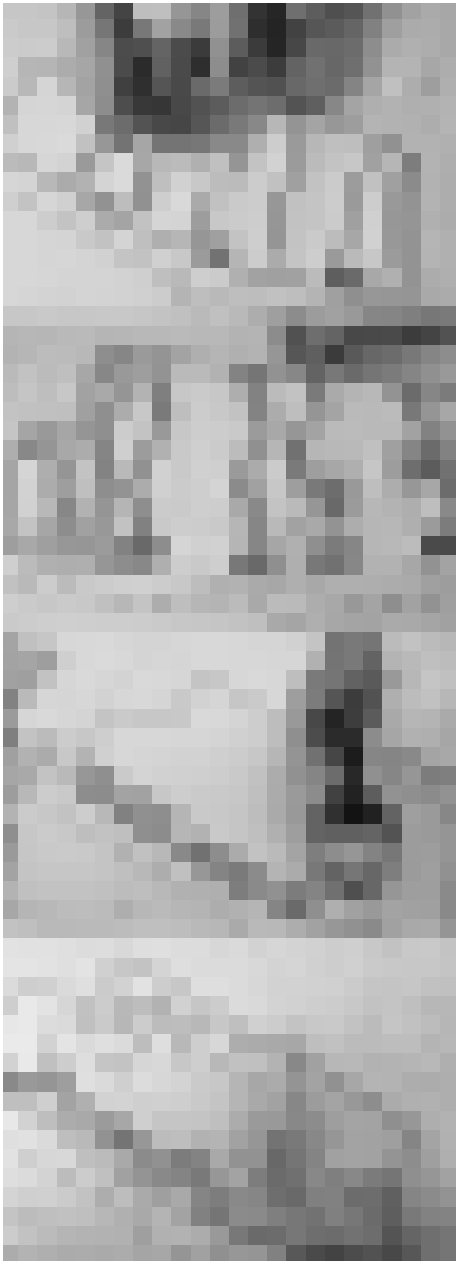
Group 1t | Axonometric Section



Group 1 | Concept Diagrams

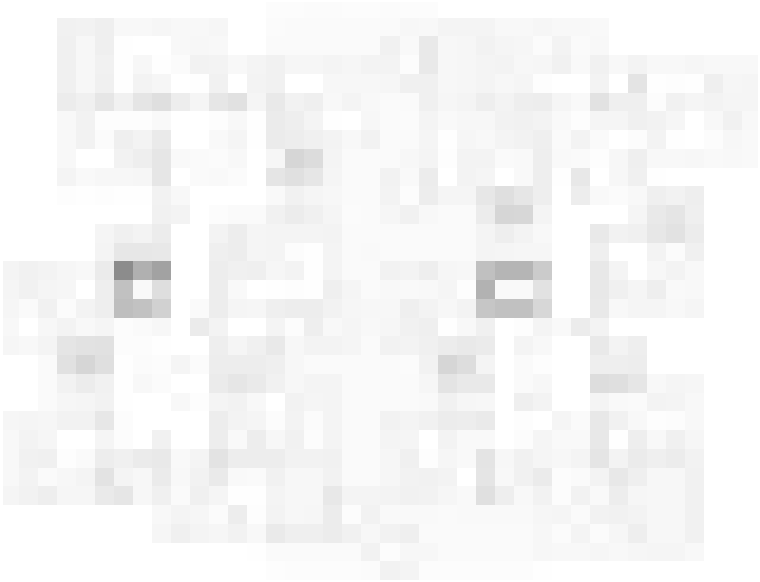


Group 1 | Isometric Sections



Group 2 | Working Models

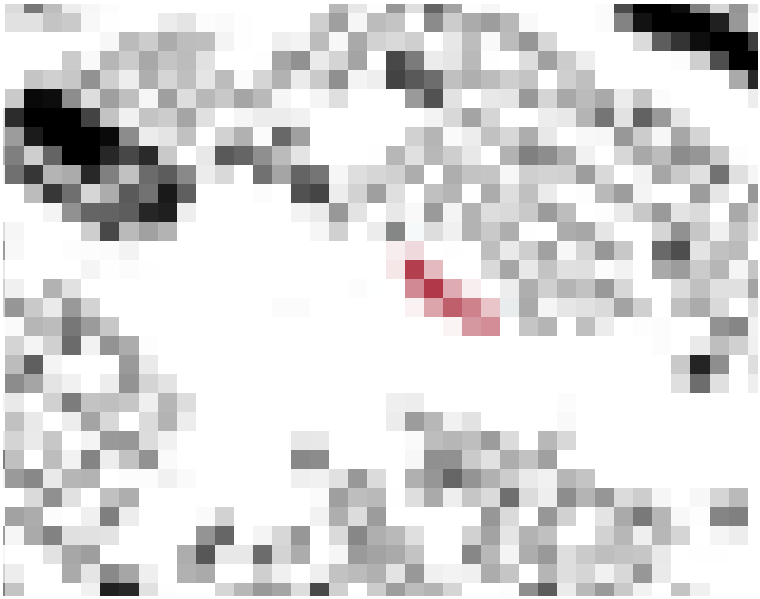
Group 2 | Sketches



Group 2 | Ground Floor Plan

Group 2 | 3D Conceptional View

Group 3 | Urban Scale Plan



Group 3 | Figure Ground Plan

Group 3 | Upper Floor Plan

Group 3 | Ground Floor Plan

Group 3 | Section View

WS.E
Giancarlo Mazzanti

WS.E

Giancarlo Mazzanti

Tutor: Michele Porcelluzzi

Participants:

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Polina Kozhevatova
Krzysztof Lichocik
Wu Mengya
Guram Niauri
Orhan Efe Ozazman
Ilaria Turtula
Yan Xiuru
Luigi Zanella

Playing with anomalies

This workshop explores the possible roles that architecture plays with today as a learning mechanism and in cultural development. Beyond recognizing architects as technical actors, we seek to explore the disposition of them as an agent that fosters interactions between a large diversity of actors. The study has as its central axes and articulators, concepts such as play, ludic, and anomaly, which will be seen as opportunities for construction of acting spaces that provoke new ways of living.

The mission is to establish mechanisms that produce - fundamentally-new events and interpersonal relationships, trying to placein a crisis the ideal of modern functionalism that is based in the efficiency.

Architecture doesn't have one single end based on effi cacy and utilitarianism, which is summed up in what we call function in architecture.

We are interested We are interested in architecture as a strategic device for the common good, which is defi ned by what it does (human and material actions) and not only by its substance (meaning). An architecture that seeks the construction of social relationships between users with a more human condition, not exclusively based on economic production, where before thinking about the material form and function, the effects that it produces in their immediate surroundings are considered.

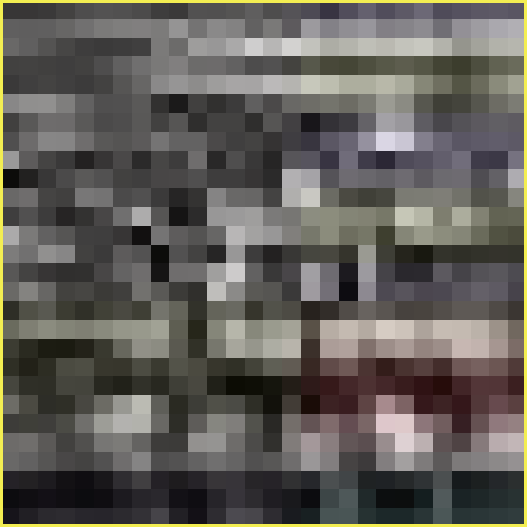
The course seeks to reaffirm the idea in "The value of architecture does not lie only in itself, but in what it is capable of producing", this statement aims to refl ect on what generates or produces the architecture that we project day by day. of the possible behaviors of the agents that compose it, and above all in what it means as

a human construction and beyond what is human par excellence; we will explore what we will call the Performative and relational character of Architecture.
We will work studying the playful nature of these spaces. The Performative alludes to the idea of an architecture that acts, where the user is not only an observer who contemplates the work, but also an acting usurer where the architecture needs this to exist. The user(multiple agents – human and beyond the human) will be our main actor in architecture – subject–acting space.
The projects to develop will have to be spaces created for learning (Pre-School or school), but the object of working in these projects is not to resolve a functional problem, but possibly an excuse to explore other ways of organizing the use in the architecture fi eld; learning spaces will help us to understand how an educational space is organized through other mechanisms, such as pedagogical curriculums, games, discovery. In addition, we will try to introduce uses or conditions of use that are not part of them as anomalies or heterotopias (programmatic and formal) and that enter into contradiction; actions and situations that can promote other types of human and non-human relationships, especially introducing actions that do not belong to the traditional uses of a school, the question is how to introduce other activities that allow relationships with other contexts beyond space and multiplying usages and situations.

Counter-spaces and Anomalies
These are places that oppose the idea of effi ciency and traditional utility, allowing the appearance of other human relations closer to playful actions and games.
Places where everyday reality is subverted and another is built juxtaposed and in another time, they are spaces of freedom and

open to multiplicity and diversity, against an idea of univocal space defi ned by control and surveillance where effectiveness and utility are the organizing elements of the space.

Heterotopia
Among all the places that differ from the others, some are different, places that are opposed to common spaces, these are intended to cancel, compensate, neutralize or purify. They are subversive spaces that provoke other relationships that are not defi ned or conventional in the use of space, the relationships, and the exchanges that take place there.



Group 01 - Open School | Conceptual maquette

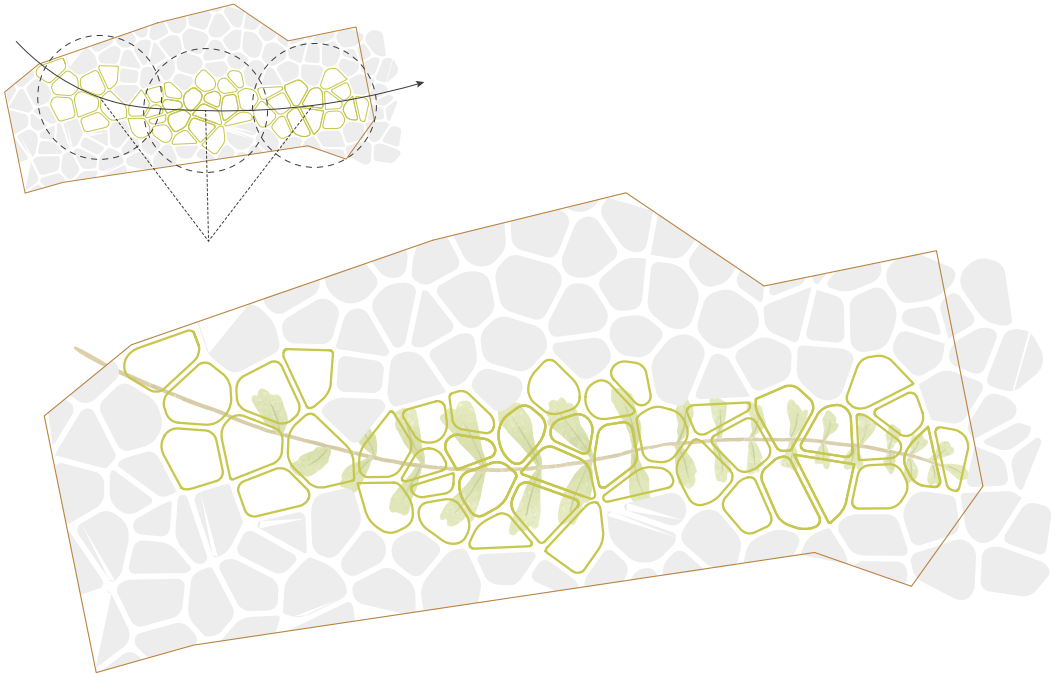
Group 01 - Open School | The school as an open system, available for the neighbourhood during the whole day

Group 01 - Open School | First floor plan

Group 01 - Open School | Ground floor plan

Group 01 - Open School | Transversal section of the school

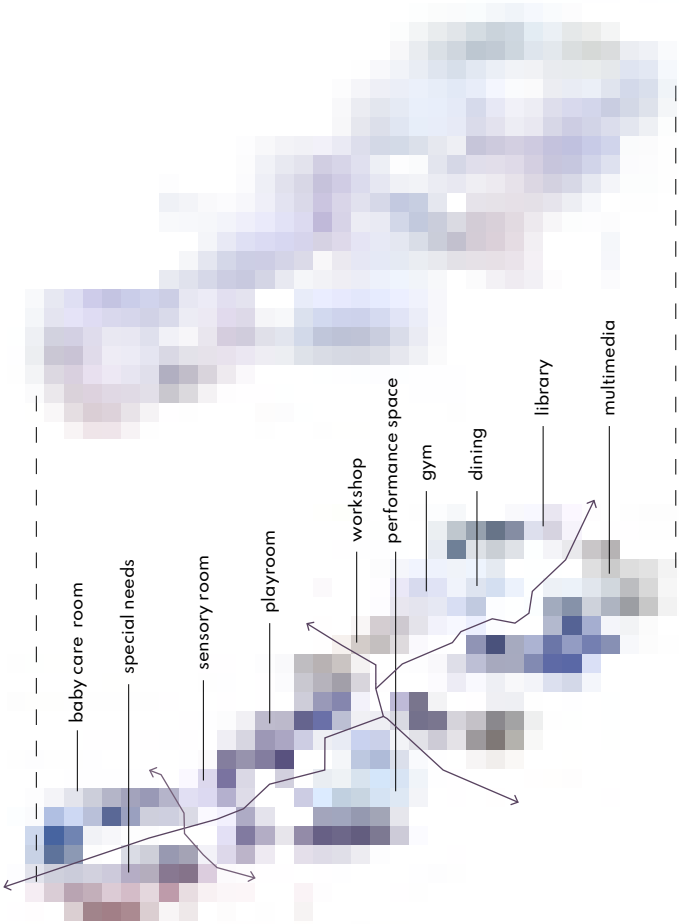
Group 01 - Open School | Overall axonometry of the building in one of its multiple possible spatial configurations



Group 2 - Organic Learning | Definiton of the concept: a system of living cells for horizontal learning

Group 2 - Organic Learning | Ground floor plan with the spaces for the nursery (blue), kindergarten (green), and primary school (pink)

Group 2 - Organic Learning | Overall axonometry of the building



classrooms

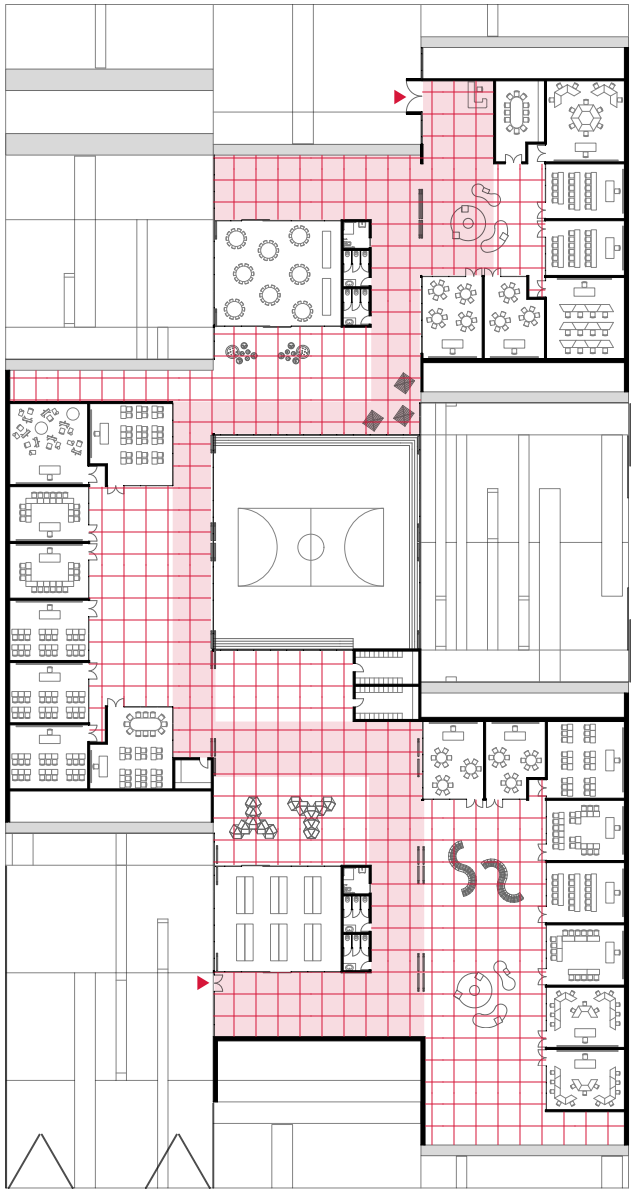
administration
offices
teacher room
WCs

private academic functions
playroom
baby care room
sensory room
workshop
special needs room

non-academic functions
dining
library
gym
multimedia hall
performance space
WCs

Group 2 - Organic Learning | Functional program of the building, with learning spaces and services united in a common spatial pattern

Group 03 - The school as a Walkable Wave | Axonometry of the two systems, one publicly accessible and one reserved for students



Group 03 - The school as a Walkable Wave | Plan of the school, highlighting the relation between classrooms and connective space

05. AUTHORS PROFILES

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Francesca Belloni is an architect with a PhD in Architectural Composition (2007). Currently, she is researcher in Architectural and Urban Design at the ABC Department, Politecnico di Milano. She is the author of several articles and essays and of some books. Beside her research activities, she is a designer of several architectural proposals and has taken part in numerous competitions.

Domenico Chizzoniti is an architect who holds a PhD from the Università IUAV of Venice. Since 2022 he is a full professor at ABC Department, Politecnico di Milano. He has taught in different universities across Italy, including the Faculty of Architecture of Parma, and Politecnico di Milano. He is the editor in charge of TECA Books Collections "Teorie della Composizione Architettonica". He has published more than 150 scientific papers in the field of Architectural Design and Theory. He took part as an author in several books and his work has been published in international journals and magazines.

Barbara Coppetti is Associate Professor in Architecture and Urban Design at the DAStU Department, Politecnico di Milano. She develops her research on the project of open spaces in public buildings with specific attention to educational areas and sustainable architecture. She participates in international conferences and design competitions; she's curator of exhibitions, author of books and articles published in specialized magazines.

Corinna Del Bianco holds a PhD cum laude, she is a post-doctoral researcher and adjunct professor of Urban Design, DAStU Department. She focuses on local development, also in the context of the global south, through the enhancement of cultural identities in changing urban environments, considering the tourism dynamics and the nature-culture relationships. As a consultant, since 2017, she has carried out research and photographic, curatorial, educational projects.

Massimo Ferrari is an architect, PhD Architectural Composition, Associate Professor in Architectural and Urban Design at the ABC Department, Politecnico di Milano. Since 2017 he has been a member of the Board of Directors of the Scientific Society Icar 14 PROARCH. He is curator of publications on architecture and art and directs his research mainly to urban design and the relationship between form and structure.

Andrea Foppiani is a PhD candidate in Architectural, Urban and Interior Design at Politecnico di Milano, where he graduated with honors in Sustainable Architecture and Landscape Design. His research field is the porous city of Emilia-Romagna, starting from the issue of spatial and environmental quality within the architectural design of public open space. He is a tutor in Architectural and Landscape Design Studios and he is part of the organization team of the Landscape Of[f] Limits International Workshop. In the editorial field, he recently started a collaboration with Il Giornale dell'Architettura.

Riccardo Genta graduated from Politecnico di Milano in 1997, after a period of study abroad at Escuela Tecnica Superior de Arquitectura de Madrid. He is the founder of the architectural firm Studio Genta Architecture, based in Pavia. He has collaborated with public administrations and has been a member of the board of Ordine degli Architetti di Pavia. Since 2013, he collaborates in the teaching activities at the Department of Architecture and Urban Studies of Politecnico di Milano, in Piacenza and Milan.

Francesca Gotti is an architect and researcher. Since 2015, she has been coordinating collective initiatives of reuse of urban commons in the city of Bergamo, while consulting for related projects in other Italian regions. Since 2016, she has been part of the editorial board of ARK magazine, curating the column "La Città Rimossa". Between 2019 and 2022, she has been research fellow at Politecnico di Milano for the European project En/counter/points, on the reactivation of neglected urban spaces; as part of this, she has been co-author of the book "The Design of Tactics" (DPR Barcelona, 2022). She is currently a PhD candidate at Politecnico di Milano and studies projects of anarchy and empowerment, in contexts of social urban poverty in South Europe. Since 2021, she is a teacher assistant in the studio Neotopia of Léopold Banchini, at the USI Academy in Mendrisio.

Karin Hofert graduated in Architecture at ETSAB-UPC in 1986. Since 1987 she teaches Architecture Design in this college. From 2008 to 2014 she was Vice-Dean for International Relations. From 2014 to 2021 she has been part of the regular visiting teachers' staff at Politecnico di Milano, Piacenza (AUIC – Sustainable Architecture and Landscape Design). The main research and study areas are public space, urban landscape, and "specialized" neighbourhoods. She has been invited as visiting lecturer and academic jury member to universities in Europe, South America, North America, North Africa, Australia and Asia. From 1995 onwards she has been building up and directing international workshops and seminars. She got awards in several design competitions for public spaces and public buildings. Furthermore, she has worked and is working in cooperation and development, directing projects on public space in Morocco and Peru. Her current professional activity focuses on the refurbishment of private housing.

Mladen Jadric teaches and practices architecture in Vienna, Austria. He is founder and principal of Jadric Architektur - ZT GmbH which realizes projects at different scales: architectural and urban, including housing, residences, art installations and experiments with new materials and technologies in Austria, USA, Finland and China. He has been teaching at the TU Wien, Faculty of Architecture and Planning and has gained extensive experience as a visiting professor and guest lecturer in Europe, USA, Asia, Australia, and South America. He is chairman of the architectural section in "Künstlerhaus" and member of the board of the architectural section in the Chamber of Civil Engineers of Vienna, Lower Austria and Burgenland.

Nora Lombardini is Associate Professor of Restoration at ABC Department, Politecnico di Milano. Her research focuses on the theory and history of restoration and on the analysis of the structural behaviour of ancient buildings, with particular attention to the constructions of the Late Roman and Byzantine period from the area of Turkey, Italy and Eastern Europe. She is involved in Erasmus projects for the university level training.

Camillo Magni teaches Architectural Design as Associate Professor at DAStU Department, Politecnico di Milano. He is author of more than 90 scientific papers, two books and co-editor for Casabella. In 2007 he founded "Operastudio" a design office in Milan and he leads the NGO Architetti senza frontiere Italia, working in several countries around the word.

Elvio Manganaro holds a PhD in Architectural Composition and is a researcher in Architectural and Urban Design at ABC Department, Politecnico di Milano The main research fields concern composition, investigated in both its theoretical and procedural structures, as well as in the educational traditions, with particular attention to the Italian geography of the schools of architecture.

Giancarlo Mazzanti was born in 1963 in Barranquilla, Colombia, he graduated in 1987 in Architecture at the Javeriana University of Bogotà and obtained in 1991 the Master in Industrial Design, History and Theory of Architecture at the University of Florence. He has been Visiting Professor at world-renowned universities including Harvard, Columbia and Princeton. He founded in Bogotá the architectural firm El Equipo Mazzanti. Attentive to the social content of his projects, he considers architecture as a means to promote the creation of communities through the development of meaningful and iconic works, where people can feel represented. His works show that good architecture can give new identities to cities and their inhabitants. Among his most famous projects there are the Biblioteca in Medellin, the Medellin Sports Coliseum, the great public canopy of the Forest of Hope in Bogotá and the Pies Descalzos school in Cartagena de Indias.

Michele Porcelluzzi is an architect and PhD candidate in Architectural, Urban and Interior Design at Politecnico di Milano. His research activity is focused on the concept of collectiveness in architectural and urban design. He is a member of ILA&UD – International Laboratory for Architecture & Urban Design – and a founding member of the research project Assume There's a Landscape.

Elsa Prochazka is an architect and university professor. She studied at the Technical University and the Academy of Fine Arts, Vienna (AT). Architectural practice in Vienna_architectureality_space and designstrategies: urban planning, housing, public buildings, museum and exhibition conception, design and crossover projects. Professor for Design in the urban planning context, Kassel (DE), Conception and direction of the Faculty raum&designstrategien, Kunstuniversität Linz, (AT), Visiting Professor at the University of Naples Federico II and Politecnico di Milano (IT). Numerous prizes and awards among others: 2020 Hans Hollein Art Prize for Architecture. www.prochazka.at.

Mia Roth-Čerina is a PhD architect and professor at the Department of Architectural Design at the Faculty of Architecture, University of Zagreb. Her interests in practice, teaching and research intersect and focus on educational spaces and exploring new modalities in architectural education. From 2010 to 2017 she has served as the Croatian delegate of the international UIA working group Architecture & Children and has been elected as council member of the European Association of Architectural Education in 2018.

Yona Catrina Schreyer is a PhD Candidate of Architectural, Urban and Interior Design at DAStU Department, Politecnico di Milano. She's been teaching and researching at international institutions such as UN Habitat (NYO), the Technical University of Munich, and the University of Applied Arts Vienna.

Giulia Setti is an architect, PhD, Assistant Professor of Architectural and Urban Design at DAStU Department, Politecnico di Milano. Her research focuses on design strategies to reuse industrial or productive architectures, and to the contemporary public spaces, with particular interest in the design transformations underway in Milan.

Claudia Tinazzi is an architect, Ph.D. in Architectural Composition, researcher in Architectural and Urban Design at ABC Department of the Politecnico di Milano. Her research activity concerned the figure of Aldo Rossi, since 2015 she has been dealing with the topic of the architecture of schools.

Paolo Vitali is an Architect EPFL and Research professor at the University of Applied Sciences and Arts of Southern Switzerland (SUPSI). Head of the degree course in Interior Architecture and international coordinator of the International Master in Interior and Architectural Design (IMIAD). His main areas of teaching and research are museography, architectural composition, school architecture and office architecture. He combines his academic activities with his work as a designer.