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INNOVATION AND CHANGES IN THE DIDACTIC SPACE

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Abstract

In Italy, the theme of the school, and more generally of education in the broadest sense, already in turmoil before the epidemic, seems to be exploding today in all its urgency, both because of the instances - above all pedagogical - of transformation brought by the pandemic itself (which from this point of view has acted as a catalyst), and because of the uncertain consequences of a building heritage that now largely needs to be restored, because it is architecturally and technologically inadequate. This has led to the structuring of a literature review that takes into account two main time spans: on the one hand, that of the 1960s-1970s (often called "the golden age of school"), investigated through the international architectural journals of that period, where the typology-technology problem emerges strongly; on the other hand, the selection (through Scopus, WoS, etc.) of current or recent studies and pedagogical experiences related to new technologies. The criterion for the choice of case studies is therefore based on their propulsive potential in relation to today's transformation needs, seeking to consider the school as an organism and not merely as a set of functional parts (as much current literature does).

Keywords

School Buildings, Learning Environments, Teaching Practices, Educational Technologies, Third Teacher

1. Introduction

It may be useful, in my opinion, to make a preliminary excursus on the current situation utilizing two diagrams that I have personally elaborated, starting from two diagrams that appeared in April 1968 in the American magazine "Progressive Architecture", updated. These diagrams try to give a big picture of the most debated problems, highlighting the questions to which the research tries to give answers. The first figure (fig.1) shows, in the central stamp, the data of the Italian school heritage to date, with the constellation of themes that revolve around it.

The problems facing schools are both pedagogical, with the persistence of frontal teaching in an almost totalized manner; and technological, with the inadequacy of the installations and the insecurity of the load-bearing structures (especially prefabricated ones); and spatial, with most schools still organized according to the old classroom-corridor alliance (Benade, 2020). The average age of Italian schools is 52 years.

The demographic projections for 2030 are also relevant for school buildings, especially as regards long-term planning. The low birth rate would lead to a decrease of about one million students by that date (Ansa, 2020), with a consequent surplus of classrooms and square meters, with a reduced need for professors and staff, which would also potentially lead economically to savings of around 2 billion € a year (Fondazione, 2020).

This unfortunate degrowth should be understood not so much as a chance to "save" public money but as a chance to reorganize schools and provide them with all the facilities currently lacking, such as group spaces, individual study spaces, laboratories, informal and relaxing spaces, etc (Dudek, 2000). And it would open up possibilities for the reorganization of the school system in the long term, with the possibility of calibrating and prioritizing essential interventions right from the start. I have also listed in the top right-hand corner some questions that arise from reading this picture, with a view to a reorganization that cannot be a one-off but needs a clear and courageous future vision. But these are questions that we will analyze in more detail in a moment.

In the second figure (fig.2) we wanted to give shape to the history of education from its birth until today. If we retrace the fundamental stages of education, we realize how the school, with the D.A.D., seems to be in a kind of degree zero of education.

From Socrates' one-to-one relationship with his pupils, through all the stages that have characterized the school space, summarised here in slogans, we now find ourselves in a situation similar to the first, but in which even the teacher disappears from the physical space, to appear on the screen of a technological device. In a Borgesian twist, we would like to take this scenario to its extreme consequences, imagining a dystopian picture in which students and teachers experience a common space, but without bodies, virtual, made up of vector surfaces crossed without moving a foot, of faithful avatars who take the place of limbs (the students) sitting comfortably in a chair with a 3D visor. And it is enough to think of Zuckerberg's dangerous motto "future is private", or of the spread of streaming platforms such as Twitch, to realize how this hypothesis is not too far off. So, if Nietzsche's words are true: "All culture in our universities passes from the mouth to the ear" (Nietzsche, 1872), it is also true that a large part of a student's education passes through the school space as an educational environment (O'Donnell et al., 2010), both in terms of the social relations it brings with it, and in terms of the intrinsic capacity of space to encourage or hinder well-being, which is a prerequisite for all learning. A civil conscience can only develop through confrontation and reciprocal relations, something that even the appeals of contemporary media debate sometimes seem to forget.

The aim of this research is therefore to find stimulating ideas for the future reorganization of schools in the architectural field, to avoid "breeding useful employees and ensuring their unconditional surrender" (Nietzsche, 1872).

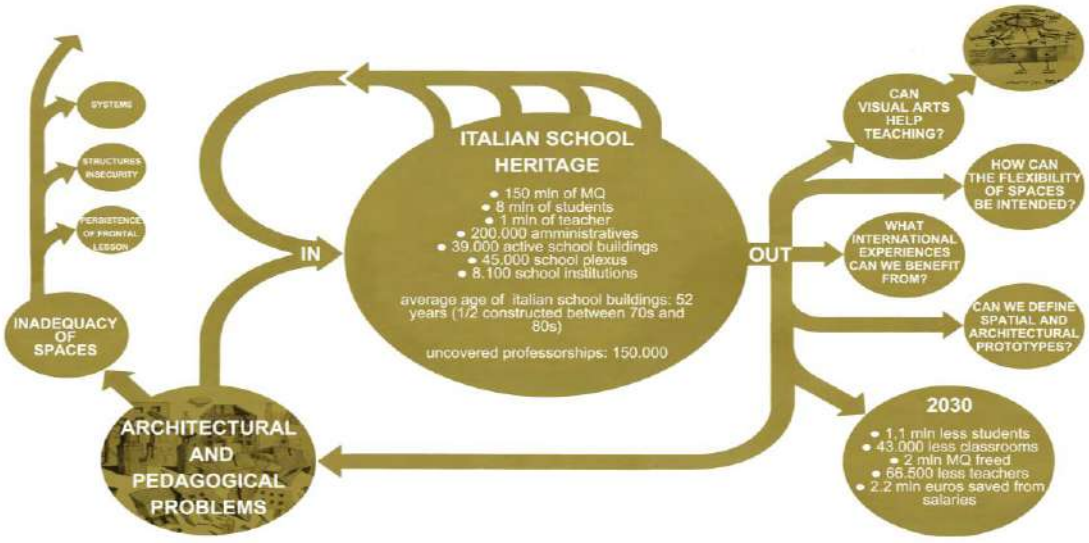

Figure 1: *Personal Elaboration of The Current Situation of The Italian School Heritage (Source: Anagrafe Edilizia Scolastica, MIUR)*

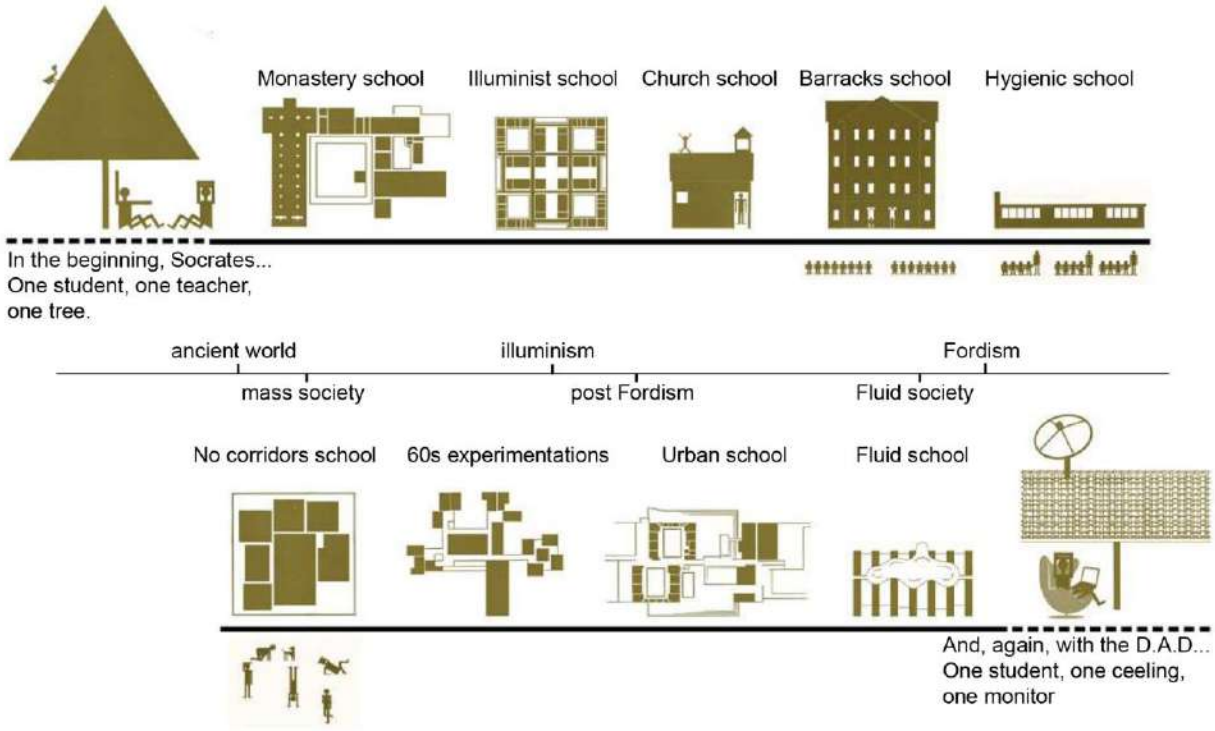

Figure 2: *Re-Elaboration of A Diagram That Appeared in The US Magazine Progressive Architecture in April 1968*
(Source: Personal Elaboration)

2. Literature Review

Hence the research has identified two-time spans to be studied bibliographically: the current one and the one from the 60s and 70s. If the first one is obviously useful to understand the tendencies underway today with respect to the conception of school buildings and education in a broad sense, the second, as denounced by eminent historians such as the German Tom Holert, in his book "Politics of Learning, Politics of space. Architecture and the education shock of the 1960s and 1970s", is very important because it is the era in which most of the schools active today were built (due to mass education) and because many of the issues on the agenda today, such as open space, saw the light for the first time.

2.1. Digital Transformation of Schools: Only Formal or Radical?

> *The sooner we realize that school will be completely different in the future the better, and the sooner we dare to take big steps the better. [...] Very often I think that computers are used as if the kid is programmed by the machine. The computer programs the kid to give him the right answer on the multiplication tables and everything. For 30 years I've been trying to reverse*

> *this process: it should be the kid programming the computer, and by programming the computer the kid learns through teaching and action.*
>
> (Papert S., la Repubblica, Roma, 14 settembre 1998)

The public debate on schools today seems to be polarised by two opposing positions: on the one hand, supporters of digital innovation see the use of technology as the only possible future for schools. On the other hand, conservatives who see technological innovation as a threat to learning, reject it in the name of the 'good old days. "The question is not to choose between the two or to find a mediation, but to take a step back and put digital 'on the table' (the metaphor refers to Masschelein and Simons (2013, pp. 39-41): the authors describe the core of the scholastic as the act of «putting something on the table», it is to say to make some content public and questionable) to understand how technology affects the school experience, in what ways it can be used and how it affects spatial aspects" (Gobbi & Rovea, 2021).

During the pandemic, the school, made of thresholds, places, and passages, was replaced by a single online space, all open and dematerialized, where the experience of moving through something unknown is denied because everything is immediately visible to the observer (Derboven et. al., 2017). However, despite the substantial change brought about by the closure of schools, teaching from home has been largely delegated to the old logic of passive consumption of information and knowledge (Australian Academy of Science, 2020), rather than the elaboration of new ideas and solutions to real problems (Sahlberg, 2020). Even the space issues that came out of the summer debate did not find continuity because everything was then moved to D.A.D. with the arrival of the 'second wave'.

For some years now, the use of new technologies has led to the paradigms of 2.0-3.0 (and soon 4.0) schools, in which the participatory and empowering instances of students seem to be delegated entirely to the interaction with the technological object as if the educational content were guarded and disseminated by the device, or as if the experience of space were reduced to wandering through the open-space 'fluids' of the new schools, always looking at the screen (Pezzetti, 2020),. The pandemic is an opportunity to rethink certain obsolete principles that define the current school system, but this possibility must be based on clear and critical principles, not on the rhetoric of the "new positivism" (Hilli, 2020), For this reason, the contribution of the late Seymour Papert, mathematician, and pedagogue, first collaborator of Piaget, then pioneer of artificial intelligence and educational technologies, seems fundamental. He was also a collaborator of Reggio Children (Edwards et al., 2011), has dedicated his life to forms of learning that make it possible to

manipulate the digital to suit educational needs. To rethink a school as a place where students create new worlds as a result of learning. For this reason, the contribution (already experimented with in Reggio Children and other educational ateliers) that video art can make to the didactics and architectural design of schools also seems important. Think of the school as a working tool, a place in which to organize knowledge spatially and return it through digital narrative paths. The work of artists such as Studio Azzurro in the field of installation and didactics also comes to mind as a means of bending the digital to meet pedagogical needs.

2.2. The Debate of the 1960s-1970s Through Architecture Magazines

In number 27 (May 1973) of the four-monthly review Op.cit. (directed by Renato de Fusco), entirely dedicated to the aspects of cultural reduction, stands out on page 30 a short article by Gillo Dorfles entitled "Reduction to object, reduction to project". Dorfles emphasizes what he sees as a new dichotomy in the architectural culture of those years, in which two contrasting attitudes contrasted: that of constructing undifferentiated buildings, almost without a project, and that of developing projects without any pretense of realization or objectivization.

> *What, on the other hand, seems to me to be entirely peculiar to our time (and perhaps to the period from the 1960s onwards) is a twofold reductive phenomenon, - which can in part also be linked to a sort of "stylistic epoch" - but which more properly can be understood as pointing in two synchronous and opposite directions: reduction to an object, and reduction to a project. Two reductive types that lead - and this is the point that seems most important to me - to the occurrence of "objects without a project" and "projects without an object"; or rather that lead to the preconception of the existence of two types of operations.*
> (Dorfles G., *Riduzione ad oggetto, riduzione a progetto*, in "Op.Cit.", n. 27, Napoli, 1973)

If the second current is still clearly identifiable in the suburbs of our cities, which in the years following the war acted first as a trigger, then as the Far West of the economic boom, with openly speculative interventions lacking in spatial quality. In a certain sense, contemporary architecture is a child of the former, not only because of the increasing preponderance of graphic and communicative aspects instead of constructive ones but also because of a sort of inscrutability that makes it, even when built, increasingly distant from the context in which it is located.

So, on the one hand, there is the "meta-project", experimental and with infinite possible variations; on the other hand, there is the realized project, rarely provided with technological-typological qualities (if we consider the large scale), even if there is no lack of excellent examples.

In fact, in the sixties and seventies, journals were published which, sometimes even from university desks, launched provocations at an increasingly standardized professional world. These magazines tried to challenge the repetitive nature of ordinary buildings with their visions and projects, sometimes idealistic but highly critical and speculative designs.

However, among the contradictions of those years, to become aware of them, it is enough to open certain magazines and take part in the indirect dialogue, often within the same page, between articles or illustrations of "rupture" and winking building advertisements. However, as I was saying, it was in those years - and inherent in the disconnect between reality and theory, between elite and mass culture - that increasingly original and advanced research and theories were developed, not only on the urban fact and on the relationship with history, but also the school system, and above all on the spaces of education, which, perhaps because of the quality of the efforts produced, did not find repercussions (except in a few happy examples) either in construction, or in the regulatory technique, or the common consciousness and knowledge.

Thus, scrolling through the pages of those magazines, one comes across projects based on the same themes that are now the focus of attention, now proposed as new and innovative because they are unaware of that glorious season of experimentation.

The majority of school buildings in Italy, as Leschiutta denounced as early as the 1970s, are now new and innovative (Leschiutta, 1970), are linked to a stereotyped image that is linked to the institution's more traditional formulas. But since the physical environment, and therefore the architecture, can itself constitute a stimulus, not only through its functional but also its formal characteristics, it is necessary for the school building to acquire the possibility of transmitting "messages" such as to contribute decisively to the renewal of the school system.

It is then that we realize that, now as in the 1960s and 1970s (which is also the period in which most Italian schools saw the light of day), there is an urgent need to regain a figurative capacity, as opposed to the reductionist aridity that has given rise to the functionalism of our schools, almost all of which are conceived as mere assemblies of parts rather than as an organism.

Already in the 1947 issue 220 of Domus magazine, then directed by Ernesto Nathan Rogers, and dedicated to "educative architecture", the school device was conceived as a picklock for the re-structuring of the future country. And in the article by the pedagogue Ernesto Codignola, revolutionary impulses were unleashed, anticipating many contemporary theories.

> *It is necessary to start the revolution from the outside. Erase even the traces of passivity, abolish the desks, the chairs, the teaching aids, the textbooks, testimonies of pretentious mediocrity. [...] The school claims to educate to freedom and individual initiative through mechanism and slavery.*
> (Codignola E., *Scuola, palestra di vita*, in "Domus", n.220, Milano, 1947)

With these words, Codignola proposes and exalts active and empowering teaching methods, in which terms such as 'freedom' and 'self-government' become key to the transformation of the school from 'prison' to 'community'. In the same way, the overcoming of passive, frontal teaching to make room for the specialization of the teaching staff and for greater freedom in the active reworking of learning on the part of the students is the cornerstone of the most stimulating and daring part of the international debate of the 1960s-1970s. One example of this is the American story revolving around the figure of the pedagogue J. Lloyd Trump, who, to cope with a great shortage of teachers, attempted to reorganize the entire national school system around principles of student empowerment, undermining the classroom to make way for differentiated forms of learning, either individual or in groups, and delegating the frontal lesson to seminars with several classes at the same time and teachers specially trained in theory. This avoids the need for a teacher to repeat the same lesson several times to different classes. Moreover, since Trump has delegated the design of meta-schools to lead architects, there are several designs and architectural examples of how such pedagogical ideas can have an effective impact on the quality of spaces.

In short, the school should be understood as an infrastructure of knowledge (Cuyvers et al., 2011), a space that can organize knowledge in places with different characteristics, with the capacity, since architecture is a language, to make meaning. Space is of interest to pedagogy and didactics in that it is not a passive or neutral container but an active object of education (Bøjer, 2020), since it conveys information, discloses meanings, reveals values; and thus, appears as a methodological device expressing the school's educational approach. This relationship with space lies in living, the fundamental characteristic of which is care, custody, and cultivation.

3. Research Methods

The methodology adopted aims at establishing a "bridge", a place of contact and exchange, between humanistic research "upstream" and the project "downstream". If theoretical research consists of a critique that is able to draw the most innovative aspects from the debate

through a comparative-evolutionary method, the study of projects also aims to be a critical synthesis, but through the tools of composition (proper to architecture), capable of generating an "autonomous" and "parallel" knowledge with respect to the logos/verbal discourse.

3.1. Comparative Analysis

In the light of what has been said, the research has been developed through the comparative analysis of case studies, obtained from the reconstruction of events and key figures of the sixties and seventies, which, due to the strong emphasis on the technological-typological problem linked to the school debate of those years, it was considered useful to relate to the most significant contemporary research, characterized by the same problems. The criterion for the choice of case studies is therefore based on the propulsive potential that they have concerning today's instances of transformation. The comparison also aims to develop an Atlas of Architectures useful for design today.

To draw up the Atlas, at this stage, the research has concentrated mainly on consulting and cataloging international architectural journals, which are summarised by countries in Fig. 3. This research starts from the beautiful catalog of the traveling exhibition "CLIP, STAMP, FOLD", which reconstructs the editorial events of the architecture magazines of the 1960s-1970s, without however mentioning the schools (Colomina & Buckley, 2010). On the contrary, it presents a very rich list of journals, which can be defined as complete, and from which I started my consultation in the library.

Instead of starting directly from a contextual approach (contexts/case studies), it seemed useful to investigate the relationship between typology and technology in a broader sense. In doing so, four themes emerged from this investigation which we considered fertile and on which we focused our attention:

- Pedagogical Activism and Technological Device
- The School and Prefabrication
- The School as A Civic Centre
- The School-Machine

The four themes belong to a lexicon typical of the 1970s, which has, however, been back in vogue in manuals and government programs for at least ten years. In fact, there is a daily discussion of technology at the service of pedagogy, of opening up schools to the public in extracurricular hours, precisely because of their capillary diffusion within the territory, of

prefabrication, or in any case industrialization of the production and management processes of physical structures, and of the school as a flexible condenser (machine) of social activities.

An excerpt from the cataloging of the articles by the four themes is given in Fig. 4, in which they are also distinguished by their theoretical or practical nature. On the other hand, in Fig. 5 we can see graphic restitution of the spatial and topological organization of some of the schools investigated according to the four categories.

Subsequently, from the themes, the protagonists of the debate were then identified and discussed in-depth, an extract of which is given in the presentation, and which I summarise below:

● The Figure of J. Lloyd Trump (USA), Team Teaching, E.F.L.: Experimentation with The First Technological Devices for Teaching and The Typological-Pedagogical Revolution to Cope with The Great Shortage of Teachers.

● The Figure of Denis Clarke-Hall (UK), From Prefabrication to Overcoming It, With Examples from New Brutalism.

● The Figures of Oriol Bohigas, Joseph Maria Martorell, And Their Studio MBM Arquitectes (Spain), For the Civic Concept of The School Building and The Figurative Emphasis on Places of Sociability.

● The Revolution in University Teaching in France, The Pedagogical Units, And the Work of the "Pedagogical Antennae" On the Ground, With the Design of Numerous Schools.

● The Eclectic Figure of Melvin Charney And the Slum Schools Etc.

Figure 3: *Overview of Magazines from the 60s and 70s Consulted (Source: Personal Elaboration)*

n.	magazine	year	contents		topics				articles
			casestudies	theory	pedagogical activism techological device	school and prefabrication	school as civic centre	school-machine	
1	AF, v.112, n.3	1960							Trump plan
2	AF, v.116, n.4	1963							Plug-in school
3	AF, v.126, n.5	1967							High School plan
4	AF, v.135, n.5	1971							School buildings
..	..	..							..
5	PA, v.XLI, n.9	1960							British school
6	PA, v.XLI, n.9	1960							Campus design
7	PA, v.XLI, n.9	1961							Urban school
8	PA, v.XLI, n.9	1961							Mario J. Ciampi
..	..	..							..
9	AR,v.127,n.755	1960							Further education
10	AR,v.127,n.758	1960							Richmond school
11	AR,v.127,n.760	1960							Training college
12	AR,v.127,n.761	1960							Commonwealth
..	..	..							..
13	AAQ, v.1, n.3	1969							Thecnological Age
14	AAQ, v.2, n.1	1970							Components
15	AAQ, v.3, n.4	1971							Glorious School
16	AAQ, v.5, n.1	1973							Smithson
..	..	..							..
17	CdA, n.35	1959							Escuela, problema
18	CdA, n.75	1970							Escuela Jordi
19	CdA, n.89	1972							Escuela viva
20	CdA, n.112	1976							Escuela Thau
..	..	..							..
21	2C, n.1	1975							Stirling
22	2C, n.8	1976							Aldo Rossi
..	..	..							..
23	LCB, n.4	1962							Bakema
24	LCB, n.2	1963							Village d'enfants
25	LCB, n.1	1964							Candilis
26	LCB, n.1	1967							Germe de ville
..	..	..	..	..	..	..	..	..	..
146			93	53	69	33	58	15	

Figure 4: *Ranking of The Most Promising Articles from the 60s and 70s According to The Four Categories*
(Source: Personal Elaboration)

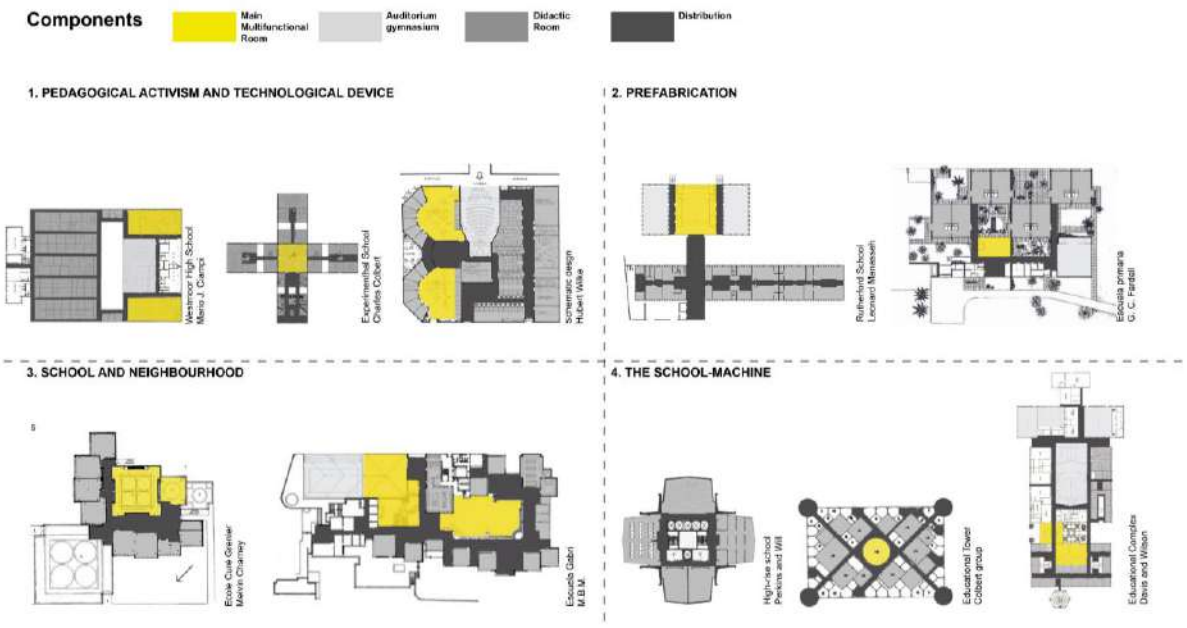

Figure 5: *Spatial Organization and Typology of The Four Topics*
(Source: Personal Elaboration)

These examples from the 60s and 70s are intended to serve as picks for current issues and themes, to which a bibliographic search through Scopus sites, Web of Science, etc... and recent publications from foundations, research organizations, and universities, is dedicated. These publications were selected by crossing keywords concerning three families (Fig.6): architectural space, pedagogy, technology. From this initial screening, the papers with the most promising abstracts were selected, then analyzed in detail, and schematized into the four categories (Fig.7).

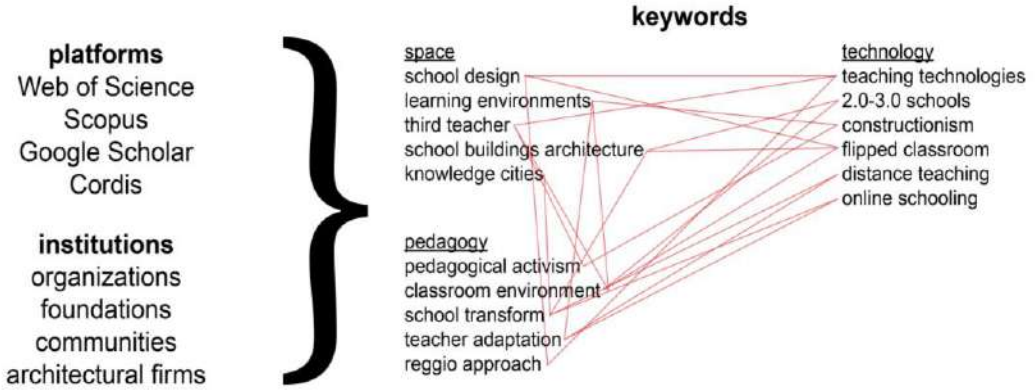

Figure 6: *Crossing Keywords for Research of Recent Papers on Platforms and Institutions (Source: Personal Elaboration)*

n.	authors	year	contents		topics				field
			casestudies	theory	pedagogical activism techological device	school and prefabrication	school as civic centre	school-machine	
1	Gobbi et al.	2021							Philosophy
2	Sahlberg P.	2020							Pedagogy
3	Schleicher A.	2020							Sociology
4	Pezzetti L.A.	2020							Architecture
5	Niemi K.	2020							Architecture
6	Grannäs et al.	2020							Architecture/Ped.
7	Hilli C.	2020							Pedagogy
8	AA.VV.	2020							Architecture
9	Bøjer B.	2019							Architecture
10	Woolner et al.	2018							Architecture
11	Bannister D.	2017							Pedagogy
12	Charteris et al.	2017							Arcitecture/Ped.
13	Derboven et al.	2017							Pedagogy/Tech.
14	Benade L.	2016							Pedagofy
15	Harasim L.	2012							Architecture/Ped.
16	Johannesen	2013							Pedagogy
17	Edwards et al.	2011							Pedagogy
18	Van Winden	2010							Architecture
19	F. Agnelli	2021							Pedagogy
20	A.A. of Science	2020							Pedagogy
21	OECD	2020							Pedagogy
22	F. Agnelli	2020							Pedagogy
23	F. Agnelli	2020							Architecture
24	Baldacci et al.	2020							Pedagogy
25	Bonaiuto et al.	2019							Architecture
26	Tosi et al.	2019							Architecture
29	F. Agnelli	2019							Pedagogy
30	OECD	2018							Pedagogy
31	OECD	2017							Architecture
32	Borri. S.	2016							Architecture
33	OECD	2015							Architecture
34	MIUR	2013							
..	..	..	..	..	..	..	..	..	
41			21	20	36	..	19	..	

Figure 7: *Ranking of The Most Promising Recent Papers According to The Four Categories (Source: Personal Elaboration)*

3.2. Research Tools

Research tools used and results produced:

● Construction of A Critical Bibliography Organized by Themes

● Keyword Search on The Main Bibliographic Databases for Scientific Publications, Such as Web of Science, Scopus, And Others

● Preparation of An Atlas of School Architecture

● Preparation of An Anthology of Texts

In Particular, The Research Consisted Of:

● Consultation and Cataloguing of School Projects and Articles Useful for Reconstructing the Debate on Schools That Characterized The 1960s-1970s, Which Grew Up in National and International Architecture Magazines.

● Search for Publications by Institutions Active in The Field: Fondazione Agnelli, Aes, Indire, Oecd, Cirpa, Csail, Etc., With A Focus on The Theme of New Technologies and The Visual Arts in Relation to The Post-Pandemic.

4. Research Centers as The Main Stakeholders

Since this research is very broad, it will be very useful to have a comparison with the institutions and research organizations active in this field, with the possibility of understanding how to proceed in the future and which roads seem to be the most promising. The possible interlocutors and stakeholders identified so far are:

Italian foundations and research institutes:

● Fondazione Agnelli: is an independent, non-profit social science research institute. It was set up in 1966 in Turin, where it has its headquarters, by Giovanni Agnelli, on the occasion of the centenary of the birth of the founder of Fiat. Since 2008, the Foundation has focused its activities and resources on education (school, university, lifelong learning), as a decisive factor for economic progress and innovation, social cohesion, and the development of individuals.

● Indire: The National Institute for Documentation, Innovation, and Educational Research (Indire) has been the point of reference for educational research in Italy for over 90 years. It develops new didactic models, experiments with the use of new technologies in training courses and promotes the redefinition of the relationship between learning and teaching spaces and times.

International institutes and networks:

● European Schoolnet: is the network of 32 European Ministries of Education, based in Brussels. Since its founding in 1997, European Schoolnet has used its links with education ministries to help schools become effective in the pedagogical use of technology, equipping both teachers and pupils with the necessary skills to achieve in the digital society.

● CSAIL: MIT's Computer Science and Artificial Intelligence Laboratory pioneers new research in computing that improves the way people work play and learn.
schools, teachers, researchers, and industry partners (Neotech srl, Studio Azzurro srl).

5. Analysis and Conclusion

In conclusion, we can say that, with school and education, we always seem to be starting from scratch, as if this important area of society has always been resistant to change. The same innovative demands brought by the contemporary debate are almost the same as those of the 60s and 70s.

It, therefore, seemed essential to us, when talking about technologies, school-civic centers, and active pedagogies, to start first of all by studying past experiments that have already taken place, so as not to fall into the same errors. If in the past the use of technology and new teaching practices was limited by the cost and excessive size of the equipment, together with an architecture that was not very sensitive to teaching, partly because of the overcrowding of classes, today it seems useful to re-decline certain instances to contemporary technical-administrative possibilities. It is therefore natural to think of a "propulsive" use of school equipment and spaces, capable of generating content and producing culture, and not just passively transmitting it to students. The school of the future would then be a laboratory, a creative forge in which the architectural space too, together with a new way of teaching, would make possible interpretations, readings, contaminations between disciplines hitherto juxtaposed according to the logic of the "watertight compartment", of the classroom-monad.

While research has so far focused on literature through the relationship between pedagogical events and architectural typologies, there is still a lack of cataloging and technical evaluation of school environments, capable of reformulating possible spatial aggregations for the school of the future. The attempt will be to understand how taking into account the energy issues that are nowadays very influential (negatively) on the budget of schools, it is possible to reorganize spaces without necessarily arriving at the logic of the undifferentiated "shed", but through the

articulation of learning spaces (MIUR, 2013), both public and open to the community and intimate, with specific peculiarities. In addition to the architectural aspects, the research would then need to be able to compare and reason with experts from other disciplines such as pedagogy, sociology, civil engineering, and plant engineering, as well as with experts in terms of legislation, thanks to whom it would be useful to understand the steps and stages at a bureaucratic level, capable of triggering certain possibilities for change and innovation.

CULLING OF JOURNALS	
USA	
Architectural Forum	
	● 1960 Volume 112, n.3, March
	Three ace schools for the Trump Plan, Frank Lots Miller
	● 1960 Volume 114, n.5, May
	Big top for teaching, arch.Claudill, Rowlett & Scott
	● 1961 Volume 115, n. 5, November
	Technology: Flexible teaching space, George Zimbel
	● 1963 Volume 116, n. 4, August
	Technology: the "plug-in" school, Bernard P. Spring
Progressive Architecture	
	● 1968 Volume XLIX, n.4, April
	The school scene: change and more change, Jean C. Roman
	● 1972 Volume XLXIII, n.2, February
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