La concezione di uno spazio scolastico contemporaneo non può prescindere da aspetti che richiedono un confronto a scale diverse, aumentando così la difficoltà nell’ottenere risultati sistemici e soprattutto chiari. Soddisfare al contempo i più recenti studi pedagogici, bisogni funzionali e aspirazioni sociali, così come la richiesta di adeguamento alla nuova normativa e la contrazione degli investimenti pubblici, amplifica ulteriormente il livello della sfida dalla quale la politica non può esimersi. Attraverso gli interventi promossi dal Parque Escolar per l’adeguamento dell’edilizia scolastica in Portogallo, il contributo intende attivare riflessioni sul dialogo tra le diverse scale da punti di vista distinti (progettuale, educativo, sociale e impiantistico), ritenendo questa chiave di lettura una risposta paradigmatica e adeguata alla complessità dell’edilizia scolastica.

The conception of the contemporary scholar space requires a whole set of aspects that confront opposite scales, by increasing the complexity of achieving systemic, balanced and, most important, clear results. To both fulfil the most recent pedagogical ideals, the functional needs, the social aspirations, and the incorporation of the (new) legal demands, bearing in mind the public investment restraining policy, it becomes a challenge even bigger, from which the political responsibility cannot stand apart. So, through the intervention developed by Parque Escolar on the grounds of rehabilitation of the scholar buildings in Portugal, it’s important to comprehend the dialogue between different scales from distinct environments (programmatic, educational, social and infrastructural), defending this operation as a paradigmatic response to the multi-scale complexity.

Keywords
edilizia scolastica, rigenerazione, metodologia, complessità, multiscala

school architecture, rehabilitation, methodology, complexity, multiscale

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Un primo obiettivo del Programma, rivolto dunque alle strutture esistenti, prevede che le Scuole siano ‘riqualificate’ mantenendo circa l’80% della costruzione originale; pertanto, in nessuno dei 172 interventi realizzati l’edificio esistente è stato demolito. Questa scelta ha un importante valore pedagogico poiché, da un lato, mira a sensibilizzare sulle opportunità fornite dall’attivazione di processi di riqualificazione, anche su architetture di minor valore patrimoniale e storico, con interventi che rimodellano il tessuto urbano e restituiscono identità allo spazio pubblico; esempio ne è la Scuola Sá de Miranda (Fig. 1). Interessanti sono anche gli interventi sulle strutture di minore o scarsa qualità costruttiva prodotti dall’attività edilizia degli anni ’60, prive di qualità architettoniche e di relazioni con il contesto: in tal senso, la riqualificazione del Progetto Mercúrio2 è un esempio emblematico. Stesso principio qualitativo e d’integrazione urbana è riscontrabile nelle scuole a padiglione realizzate negli anni ’80 in quali il modulo prefabbricato denominato ‘3x3’ aveva portato a una riduzione della complessità progettuale e a una conseguente diminuzione del numero di spazi specializzati (Parque Escolar, 2012). È stato proprio in occasione della riqualificazione di questa tipologia di edifici che è maturata la consapevolezza che l’anonimato e la mancanza di qualità architettonica li caratterizzavano, così come l’ avanzato e diffuso stato di degrado in cui versavano, dovessero essere risolti in favore di una migliore qualità patrimoniale, funzionale e spaziale (Fig. 2).

Per promuovere più efficacemente la rigenerazione del patrimonio scolastico, un terzo obiettivo futuro prevede la riconciliazione dello spazio scolastico con il contesto urbano, e la creazione di nuove condizioni di sovraposizione di spazi scolastici e di altri usi (Le Suicide et al., 2010). La Scuola Sá de Miranda (Fig. 1) esempio ne è la Scuola Sá de Miranda (Fig. 1). Interessanti sono anche gli interventi sulle strutture di minore o scarsa qualità costruttiva prodotti dall’attività edilizia degli anni ’60, prive di qualità architettoniche e di relazioni con il contesto: in tal senso, la riqualificazione del Progetto Mercúrio2 è un esempio emblematico. Stesso principio qualitativo e d’integrazione urbana è riscontrabile nelle scuole a padiglione realizzate negli anni ’80 in quali il modulo prefabbricato denominato ‘3x3’ aveva portato a una riduzione della complessità progettuale e a una conseguente diminuzione del numero di spazi specializzati (Parque Escolar, 2012). È stato proprio in occasione della riqualificazione di questa tipologia di edifici che è maturata la consapevolezza che l’anonimato e la mancanza di qualità architettonica li caratterizzavano, così come l’avanzato e diffuso stato di degrado in cui versavano, dovessero essere risolti in favore di una migliore qualità patrimoniale, funzionale e spaziale (Fig. 2).

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l’impegno, si sono incoraggiati studenti e insegnanti a rimanere più a lungo a scuola e a partecipare ad attività che contribuiscano a promuovere una cultura dell’apprendimento (Hei- tor, 2008).

In questa prospettiva, il modello del ‘learning street’, che in alcuni progetti ha assunto configurazioni spaziali diverse – ad esempio il senso della piazza nel caso della Scuola di Rio Tinto (Fig. 6) – è stato determinante per la strategia di riqualificazione degli edifici, soprattutto in scuole a padiglione come quella di Canelas (Fig. 7) che valorizza l’integrazione del nuovo spazio poiché, da un lato evita la dislo- sione degli utenti, dall’altro supera la mera funzione di spazio per la distribuzione. In altre tipologie edilizie è stato possibile creare dei ‘percorsi di apprendimento’, come accade nel-
entro un trasportatore metallico, soluzione que-
sta che può essere riscontrata anche nella
Scuola Inês de Castro (Fig. 14). Nella stessa
Scuola le condizioni specifiche di ogni spazio
impongono comunque via via scelte diverse,
anche in relazione alla destinazione degli am-
bienti, aule o connettivo (Fig. 15).

Le soluzioni progettuali non possono quindi
essere ricondotte a una strategia tipo che im-
ponga alla macro scala di includere le neces-
sità della micro scala, poiché la condizione di
ciascun manufatto è specifica, unica e com-
plessa. È responsabilità dell’architettura trova-
re equilibrio e coerenza, articolare le diverse
scale e le destinazioni che caratterizzano lo
spazio, promuovere la sua identità, non trascu-
rando l’eredità delle preesistenze, i vincoli nor-
mativi e la “sensibilità” dei progettisti. Paradoss-
almente, e dopo che quest’esperienza si è
completata, sono risultati evidenti limiti e con-
tradizioni sui quali sarà necessario riflettere
per il futuro, soprattutto in relazione al fatto che
i dispositivi normativi della Comunità Europea,
pensati per l’insieme degli Stati membri, sono
stati adottati senza tenere conto della specifici-
cità del contesto climatico, sociale ed econo-
mico portoghese, condizionando non poco i
costi dell’intervento, anche e soprattutto per gli
adeguamenti impiantistici.

Conclusioni | Dall’approccio sviluppato, è evi-
dente che la concezione, la realizzazione e l’u-
so delle architetture scolastiche realizzate nel-
l’ambito del PMEES appaiono come esempi
paradigmatici di gestione e di confronto meto-
dologico tra scale diverse di complessità. Il
progetto della Scuola contiene in sé un insie-
me di valenze molto diverse tra loro: il neces-
sario equilibrio tra condizioni globali di d’istrut-
zione e benessere (relative a una scala universale
e collettiva) e problemi d’inclusione (relativi a
una scala locale che richiede strategie specifici-
che per gruppi sociali diversi) si traduce in un’architettura scolastica in costante confronto
tra scale diverse. Se nella scala macro è data
attenzione all’impianto complessivo, alla gerar-
chia degli ambienti e al connettivo, nella picco-
la scala, invece, le specificità e le esigenze di
ogni spazio possono essere risolte affrontando
il tema solo da un punto di vista progettuale,
pedagogico, sociale e impiantistico.

I risultati raggiunti dal PMEES sono stati re-
si possibili, all’interno di un processo comples-
so, con la progettazione di un programma d’a-
zione globale e strutturando strategie in grado
di consentire un’azione puntuale in base alle
specificità di ciascuna scuola coinvolta. La de-
definizione di un modello concettuale poliedri-
có, con un’ampia gamma di aree disciplinari coin-
volute e una ben definita gerarchia funzionale e
spaziale, ha favorito, nel confronto con le spe-
cifiche realtà di ciascuna comunità, risposte
adatte e puntuali all’interno di un processo
partecipativo. In tal modo, l’obiettivo proget-
tuale di includere la società tutta, garantendone
accessibilità alla grande varietà di spazi, è sta-
to tradotto in architetture specifiche per ogni
contesto e capaci di promuovere e rafforzare i
legami tra la Scuola e ogni rappresentante del-
la comunità. I diversi casi presentati testimo-
niano inoltre come la complessità dei requisiti
preziosi imposti dalla normativa sia stata
risolta in ciascuno degli interventi attraverso un
impegnativo esercizio metodologico di gestio-
ne del progetto.

Lo spazio scolastico sta vivendo una serie
di cambiamenti legati alla specificità di pro-
grami, didattica e metodologie di insegnam-
ento; è ormai dimostrata l’impossibilità di
promuovere soluzioni progettuali standardizza-
te, in cui l’identità e le specificità sono al margi-
ne, se non escluse, dalla concezione del pro-
getto. Occorre prendere atto che, più che il ca-
rattere identitario di un ambiente, o la risposta
to un ideale culturale e civico, le più recenti teo-
rerie pedagogiche promuovono nuove dinami-
che spaziali e richiedono risposte ai bisogni funzio-
nali, trasformando l’edilizia scolastica in un
oggetto complesso dentro una dinamica multi-
scale. Le realizzazioni presentate mostrano
soluzioni architettoniche fortemente contestua-
lizate, attente al tempo stesso, soprattutto nel-
la progettazione delle facciate, all’identità del-
ell’edificio scolastico. La scala delle individualità
è la protagonista di un processo in cui la me-
moria del passato e le aspirazioni per il futuro
cercano, attraverso l’architettura, un equilibrio
terapeutico e funzionale, senza che l’universalità
dell’”essere scuola” venga alienata.

Infine, è da rilevare come l’esperienza por-
theghese, sulla scorta dei risultati positivi con-
seguiti, abbia contribuito al dibattito interna-
tionale sul tema della rigenerazione del patri-
monio edilizio scolastico e possa suggerire in-
dicazioni metodologiche da impiegare in altri
Programmi funzionali che interessano la ri-
qualificazione dell’esistente.

Up to the beginning of 2007, «[…] in Portugal,
the great effort […] regarding school infrastruk-
tures was mainly concentrated on the network

Fig. 4, 5 | Representative schemes of the PMEES: Conceptual Model and Hierarchical Functional Levels, adapted from the original (credits: Parque Escolar, E.P.E., 2007).
expansion, through the application of typified solutions of standardized and mass construction (Heitor, 2011, p. 11). This strategy, prey of different moments of crisis, showed the urgency of constructing and costs control, factors that, consequently, had always taken the leading role. In this circumstance, strategic planning turned out sporadic, and the perspective of prevention and maintenance were nonexistent, culminating in erratic and uncoordinated repairing actions. In this context, in the late 20th century, «[…] overall, the facilities suffered from construction anomalies, physical deterioration and functional obsolescence that affect their environmental comfort, usefulness, and image» (Heitor, 2008, p. 1). During the turn of the twenty-first century, political awareness was raised for the need to constructively, spatially, and functionally rearrange the school building, in order to simultaneously adapt it to the pedagogical needs and recent legal determinations and to reaffirm its symbolic value.

In this scenario, the Programa de Modernização das Escolas com Ensino Secundário (PMEES)\(^1\) was created focusing on the rehabilitation of the pre-existing school buildings in Portugal. The public entity Parque Escolar\(^2\) developed this Program in order to administer the management of all buildings, by structuring the investments and priorities in phased interventions over a long period. The change of attitude in what concerns school management has determined the demand for a solution that, overall, in a comprehensive and systematic way, should allow to reverse the deteriorating process of high school establishments to achieve, on the one hand, an effective school building rehabilitation, and, on the other hand, promote its modernization by reference to the requirements triggered by the new standards and pedagogical models, specifically in conception and arrangement of spaces and facilities (Ministério da Educação, 2008).

This intervention was a pioneer in what concerns the management of public buildings in Portugal, resulting in multiple outcomes, consequences, and readings, from which stands out the complexity of the school organism, as well as the inevitable dialogue of scales implied. «In restructuring learning environments, planners need to develop methods for identifying complex issues and must use design processes to synthesize approaches rather than focusing on dichotomies» (Taylor, 2000). Indeed, architecture necessarily dialogues with two antagonistic dimensions that confront each other on scales that are sometimes contradictory. If the universality of the ‘being’ School imposes a collective scale, that aims to defend overall conditions, the need to include and incorporate strategies attending individualities convene a permanent contrast between scales and interests.

From the summoning of different themes (program, pedagogy, society, and infrastructure), an approach guided by the evidence of this articulation, or contrast, between scales, here mutually contaminated, will be developed. This paper is embedded in the context of an investigation project, that focuses on the study and debate of school buildings, from a universe of 74 schools in the north of Portugal, named ESCOLAS – Complexidade e Interpretação.\(^3\)

Architecture and Program | Integrating operatively the participation of the most varied Intervention agents, the PMEES assumes the responsibility to outline the construction of an architectonic Program, guarantor of the rehabilitation process of school buildings with secondary education, with a group of programmatic objectives. Firstly, the intervention context is limited and characterized by an attitude of rehabilitation. The Program determines that the pre-existing schools are rehabilitated and modernized maintaining about 80% of the original construction (Monteiro and Santos, 2020). In this sense, none of the 172 Schools that have already been intervened materializes buildings built from scratch. This circumstance promoted a double pedagogical condition. On one hand, in raising awareness of the opportunity to resort to rehabilitation processes, even before architectures of less patrimonial and cultural value, and, on the other hand, in contributing to a discussion about the values of sustainability and ecology.

Secondly, the interventions are characterized by the typological particularities of each of the intervened structures. The ambition to dignify the public school is easily recognized in the interventions on schools of a greater patrimonial and historical value, with enormous contributions in shaping the urban fabric and identity, as is exemplified by the School Sá de

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\(^1\) Programa de Modernização das Escolas com Ensino Secundário (PMEES)

\(^2\) Parque Escolar

\(^3\) ESCOLAS – Complexidade e Interpretação
Miranda (Fig. 1), but also in the re-qualification of the typified structures that, since the decade of 60s, with the Project Mercúrio, have been, gradually, alienating architectural quality, due to poor constructive quality and total disengagement with the contexts. These questions are particularly relevant in the context of the pavilion typology schools developed in the early 80s. This project, named ‘3x3’, aimed mainly to resort to industrialized construction; in order to avoid situations of disruption, the programmatic complexity presented in previous projects is abbreviated, witnessing a reduction of specialized spaces (Parque Escolar, 2012). In fact, it was in these buildings that the challenge of reversing the reality of anonymity, and the lack of architectural identity, grew, since these were the ones in a more advanced state of degradation (Fig. 2).

Thirdly, the aim was to promote a rapprochement between the school and the city, as a strategy to rehabilitate the school patrimony, assuring its social condition (Santos and Monteiro, 2019). This theme also assumes particular relevance in interventions in buildings of the ‘3x3’ typology, since these schools are mainly apart from the urban fabric. In this conjecture, it was justified particular attention to redefining urban front, architectural images, and, in some cases, to extend the intervention to the urban surroundings, so that the school can define itself as an active part in the physical and symbolic organization of a public whole, as it happens in the intervention in the School of Rio Tinto (Fig. 3).

Fourthly, it represents a programmatic ambition the requalification of the Institution image through a contemporary architecture, capable of framing the school in a current imaginary universe, but also to envision the schools in the future. This ambition articulates itself with the urgent need to provide school spaces with constructive and infrastructural technologies corresponding to the current standards of comfort and energy expenditure, as well as to the real pedagogical challenges that currently arise. The program ‘[…]’ aims to modernise public-secondary schools in order to improve and modernise the quality and usefulness of teaching and learning facilities to accommodate the 21st century educational agenda, as well as to restore the schools as centres of the community (Heitor and Marques Pinto, 2012, p. 8018:5).

In this context, the unprecedented condition of this Program is confirmed, establishing itself as a methodological instrument capable of undergoing adaptations and influence the construction of management strategies of public buildings. In fact, its structured and systemic essence, as well as its view of an ensemble, made it paradigmatic in the national context ‘[…]’ by assuming a collaborative way of projecting, ‘[…]’ these interventions assume an exemplary character contributing to the promotion of good intervention practices in school buildings (Heitor, 2009, p. 21), not being by chance that the OECD experts affirmed the qualities of the Portuguese experience, pointing out that ‘[…] reflects or exceeds the best international practices […]’ (Almeida et alii, 2009, p. 8). The Program complements itself integrating pedagogical ambitions.

Architecture and Pedagogy | The most recent reflections about the interaction between architecture and pedagogy are unanimous on affirming the significant impact that the school environment has in the teaching-learning process. The school building is a lot more than a simple container: along with the teacher’s body, with the students and their familiar contexts, it performs a true interaction system; a complex system on which the physical environment interacts with pedagogical, sociocultural, curricular, motivational and socio-economical factors (Ladiana and Lopes, 2018). In fact, it sits on the architecture the responsibility to create conditions of well-being for all uses, and spaces capable of motivating the development of the learning process.

Firstly, it is envisioned a significant spatial and functional reorganization that, hierarchically, imposes on spaces the inevitability of re-structuring in face of the promoted Conceptual Model (Fig. 4) and the Hierarchical Functional Levels (Fig. 5). It is advocated the complementarity between conventional learning means and pedagogical practices based on ‘[…]’ activities of collaborative, exploratory and experimental nature (Heitor, 2011, p. 13). The conceptual model ‘[…]’ is based on three main basic principles: the articulation between different function sectors (academic and non-academic); the guarantee of conditions for their integrated functionality; and the possibility of opening some sectors to outside usage (Heitor, 2011, p. 15). Although the existence of a special nucleus for the fulfilment of the traditional curriculum is safeguarded, these should be in constant dialogue with the informal learning spaces, that are envisioned as attractive and flexible.

Secondly, motivated by the pedagogical ideals of Maria Montessori, by the results of the experiences on the Montessori method, and by the spatial solutions proposed by Herman Hertzberger, the Program aims to diversify the activities and the programmatic valences, focusing especially on the transformation of the structural circulation spaces, in order to encourage less formal teaching processes. With the belief that the environment and the organization of spaces have an impact on the commitment on the pedagogical process, the creation of more flexible moments was sought ‘[…]’ encouraging students and teachers to stay longer at school and to participate in activities that contribute to foster a learning culture (Heitor, 2008, p. 2).

In this perspective, the ideal of learning street – that in some solutions assumed different configurations – for example, the sense of square in the School of Rio Tinto (Fig. 6), stood out in the strategy of transformation of the intervened buildings, being absolutely intelligible on interventions on pavilion typology buildings, as the School of Canelas (Fig. 7), amplifying the intention of integrating a new space capable of grouping the dispersion of spaces, but mainly of overcoming its mere condition of circulation. In buildings of other typologies, with the articulation of...
school’s educational project, without compromising the universality of the national curriculum. Imputing to the architectural program an amplification of its complexity, «[…] communities seeking to design schools for the future must think in an integrated manner to join the goals of education to those of architectural design» (Taylor, 2000).

In this sense, architecture and pedagogy are integrated into a process of multifaceted and multiscale narratives. It is up to architecture to carry out a hierarchical reflection of a social and technical nature that, through a good building, transmits that «[…] all individuals have the right to a quality educational facility […] that encourages social participation, providing a healthy, comfortable, safe, secure and inspirational setting for its occupants» (OECD, 2006, p. 18). Naturally, the pedagogical ambitions are committed with vectors of social nature, a context that supports and frames them.

Architecture and Society | The school bears an endless commitment and responsibility in the education, formation, and socialization of individuals, which only results in quality when extrapolates a pedagogical ritual based on curricular content and is based on the companionship bond between students and their different realities (Fig. 9). This space of communion, understood as ‘one more home’, must be sustained on a ‘family’ core progressively larger, in quantity and, in particular, in plurality, aware of the social responsibility duty. If we want the school to be inclusive, it is urgent that its plans are redefined for an education guided to a global, complete citizenship, free of prejudice and that recognizes and values differences (Montoan, 2003).

It is important to recognize that we are all equal, in rights and responsibilities, but different, in being, agreeing that there are differences and there are equalities we must have the right to be different when equality de-characterizes us and the right to be equal when differences give us a sense of inferiority (Montoan, 2003). It is this awareness that creates space for social responsibility, for equality in participation, collective and inexhaustible, so that the understanding that the school is the most representative equipment of the universal scale is clarified (Fig. 10): «[…] schools should accommodate all children regardless of their physical, intellectual, social, emotional, linguistic or other conditions» (UNESCO, 1994, p. 6).

It is undeniable that the school proclaims an evolutive social history in the process of inclusion that gradually has been accomplished in association with a vast number of sciences, in particular, the one of education and psychology, in its mission to improve curricular practices and social interactions. This process includes incalculable participations that seek to encourage the sense of complicity, co-responsibility, and awareness by the school regarding the disparities, sharpening its conscience to ensure a more universal society. Naturally, it is also the school’s responsibility to investigate options and ensure solutions that cover all communities, promoting social awareness, towards absolute inclusion.

In this commitment, the organization of the entire school program must promote a particular care in the distribution of the most intimate environments, such as the classrooms and spaces of a more collective character. This breaks the idea that only students learn and that it is only possible in the classroom, when in truth the school must provide learning and sharing spaces for every citizen. The openness...
to the community has been explored in various ways of awareness, providing access to spaces such as sports pavilions. Also, other spaces, such as libraries and multipurpose rooms, are able to explore activities and learning processes apart from the curricular lessons, but that contribute deeply to the intellectual and humanistic development of all (Fig. 11).

Architecture and Infrastructures | School architecture has been following the maturation and evolution in critical thinking between pedagogy and its methodologies. This dialogue, which has undergone numerous mutations from the programmatic and functional point of view, and that also adopted social ambitions, at the beginning of the 21st century, has incorporated a new responsibility of technological guidance, introducing a renewed challenge to architecture. The most recent legal provisions that came into effect as a consequence of Kyoto Protocol, resulted in the publication of a vast set of legal diplomas that, transported from the European legislation to the Portuguese normative, introduced, between 2006 and 2008, a significant change to the current legal frame. The abrupt and concentrated in time manner of these transformations led to notorious difficulties in their coherent articulation, due to its novelty, to inexperience, to the dimension of its demands and, mainly, to conflicts between each legal diploma. Every regulation, regarding energy and air quality systems certification, thermal behaviour, accessibility, and fire safety, determined the inevitability of incorporating an infrastructural load of impressive complexity. The Program consisted, due to its temporal proximity, of a key moment for experimenting and introducing the new constructive canon that came to integrate the projects in a complex scale of debate between the various agents, affirming this moment as innovative, singular and paradigmatic.

«[...] these new legal determinations set significant impositions in the incorporation [...] of a paraphernalia in the spatial characterization, a major condition in the context of investigations on pre-existing buildings» (Kazimirko and Santos, 2020, p. 221). In the same way as the social and pedagogical domain, the theme of infrastructures, in the dialogue between the universal and individual scales, manifests its protagonism in the reading of the solutions, as expressed paradigmatically in the School of Santa Maria da Feira (Fig. 12). In this sense, the infrastructural systems carry the responsibility of introducing, in the pre-existing buildings, a complex and expressive amount of equipment and networks, from which stands out a confrontation between the micro and macroscale. It is verifiable the recurrence of the solution adopted in the School Rodrigues de Freitas (Fig. 13), that extends all systems along the corridors, in this case, organized on a metallic conveyor; a solution that can also be verified in the School Inês de Castro (Fig. 14). On the other hand, the attendance of specific conditions of each space is expressed in moments of a private or individual character, such as the solution verified in the classroom of the School Inês de Castro (Fig. 15).

The solutions do not survive exclusively from

Fig. 11 | “Escola Secundária Garcia de Orta” in Vila Nova de Gaia by Ricardo Bár Gordon: library, the openness of school spaces to the community (credit: A. Santos, 2011).
a universal strategy, forcing the macro-scale to incorporate the need of the microscale, affirming the condition and the construction of a specific, unique and complex organism. It is the architecture’s responsibility to find balance and coherence, to articulate the different scales and interests that characterize the space and promote its identity, resulting from the legacy of the pre-existences, legal obligations, and the sensitivity of the designers. Paradoxically, and after this experience has passed, some factors of significant mismatch become evident, which now need reflection and re-adjustment, especially in relation to the fact that the European Community regulatory determinations, designed for all the State Members, have been adopted without taking into account the specificity of the Portuguese climatic, social and economic context, greatly influencing the costs of the intervention, also and especially for infrastructure adjustments.

Conclusions | From the approach developed, it became evident that the conception, construction, and usage of the school architectures, in particular those that resulted from the implementation of the PMEES, appear as paradigmatic examples of management, of methodological confrontation between scales and of complexity. The articulation of interests, dimensions, and scales is permanent in the most diverse themes that contribute to the formation of the school space. The necessary balance between global conditions of education and comfort, at a universal and collective scale, with concerns of inclusion, incorporating specific strategies for different social groups, has translation into a school architecture in constant confrontation between scales. While, at a wide scale, is given attention to the global infrastructures, the hierarchy of large functional groups and circulation systems, on a smaller scale, the specificities and needs of each space are addressed from a programmatic, pedagogical, social and infrastructural point of view.

As it was verified, it was possible, in the midst of a complex process, by designing strategies of global action, to create, in a methodological way, strategies capable of enabling a project action according to the specificities of each school involved. The definition of a multifaceted conceptual model, with a wide range of disciplinary areas, and translated into a functional and spatial hierarchy, allowed, in the confrontation with each community’s realities, the materialization of specific responses, in a participatory process. Also, the programmatic commitment to include all sectors of society, as well as to guarantee accessibility to the wide variety of spaces, was translated into architectures suited to each context, in order to promote and strengthen bonds between the school and every agent of the community. It was also verifiable the complexity in the articulation between the infrastructural regulated requirements with each of the rehabilitation processes, which resulted in a demanding methodological project management exercise.

The school space is experiencing a set of
Acknowledgements

The contribution, resulting from a common reflection, is to be attributed in equal parts to Authors.

Notes

1) Programa de Modernização das Escolas com Ensi- no Secundário (PMEES) was implemented in January 2007, deriving from the awareness of the state of advanced degradation of the existing schools, aiming to intervene in 332 of the 477 schools with secondary education in operation.

2) Parque Escolar – E.P.E. was created on February 21, 2007 by Decreto-Lei n. 41/2007 (Ministério da Edu- cação), with the mission of developing and implementing the PMEES, for the rehabilitation and management of school buildings over 30 years.

3) The research project ESCOLAS: Complexidade e Inte- rpretação is in development at the Architecture and Urbanism Study Center (CEAU), an integrated research unit of the Faculty of Architecture, University of Porto (FAUP).

4) Project Mercúrio, established in 1960, was coordi- nated by Arq. Augusto Brandão, asserting itself as the first standardized project for school structures.

5) Programa Especial de Execução de Escolas Prepa- ratórias e Secundárias approved in 1980, aimed to create conditions to respond to the intensification and massification of the construction of buildings for secondary education, having in perspective the construc- tion of 218 schools.

6) Maria Montessori (1870-1952) was an Italian edu- cator. She developed proposals of pedagogical philoso- phies based on a model of human development through the answer to a cultural and civic ideal, trans- forming the answer to a cultural and civic ideal, trans- forming the answer to a cultural and civic ideal, trans- forming the answer to a cultural and civic ideal, transforming the answer to a cultural and civic ideal, transforming the answer to a cultural and civic ideal, transforming the answer to a cultural and civic ideal, transforming the answer to a cultural and civic ideal, transforming the answer to a cultural and civic ideal, transforming the answer to a cultural and civic ideal, transforming the answer to a cultural and civic ideal, transforming the answer to a cultural and civic ideal, transforming the answer to a cultural and civic ideal, transforming the answer to a cultural and civic ideal, transforming the answer to a cultural and civic ideal, transforming the answer to a cultural and civic ideal, transforming the answer to 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