



Architectures of play
and education are
designed into Gradolí
& Sanz Arquitectes'
Imagine Montessori
Primary School
in Paterna, Valencia,
writes *Rafael
Gómez-Moriana*

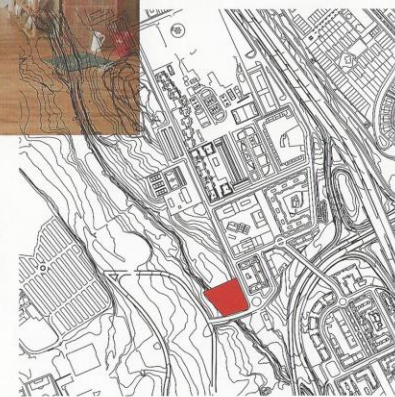
Hide



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and

seek





Pupils choose where they want to occupy from the multitude of different spaces in the school, such as 'the cave' under the stairs, as well as communal zones (below), or outdoor areas where wisteria is grown to shade the west-facing classrooms (opposite)

One of the first alterations that pupils of the Imagine Montessori Primary School wanted to make to their brand new building was to convert a concrete pillar supporting an outdoor stairway into a climbing wall. They designed and built it themselves, attaching wood panelling with climbing grips to the pillar, while at the same time outfitting a low, leftover space beneath the stairs as a chill-out zone now nicknamed 'the cave'. The story repeats indoors, where hidden spaces and out-of-the-way corners appear to be appropriated – domesticated with children's furniture and educational toys.

Leaving anything to chance, let alone to children, flies directly in the face of control freaks, but Gradolí & Sanz Arquitectes are not bothered in the least by what might appear, to some, as chaos. On the contrary, they see it as validation of their work, which is not without its own aspects of indeterminacy. Learning is a lifelong adventure that comes from 'doing' and from experiencing successes and failures – the very stuff of evolution and natural selection. We learn most effectively by trial and error: 'if at first you don't succeed, try, try again', they say. Yet the more empirical 'hands-on' approach is largely viewed as a lesser form of learning compared with more abstract and scholarly theory – including in architectural education, where dirtying one's hands mixing mortar and laying bricks was once considered normal. The result has been a growing gap between theory and practice, and a widening division of labour resulting in today's 'barbarism of specialisation', as José Ortega y Gasset termed it, or what the late David Graeber more recently called 'bullshit jobs': a highly bureaucratised society of nerds and *fachidioten* (professional idiots) in which perfect predictability must always lead to predictable perfection.

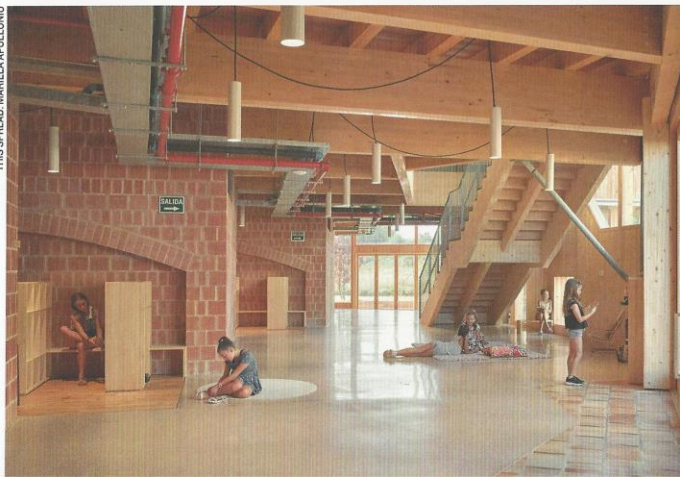
As an open-ended work, the Imagine



Montessori Primary School throws into question the very idea of 'success' as a perfectly planned and executed outcome. It is a living building that grows, transforms and learns things along the way, making it exemplary and worthy of observation for the valuable lessons it imparts in turn. The first lesson begins the moment children enter the school grounds, a wild and rugged strip of terrain containing a gully that forms a natural edge to the Valencian town of Paterna. The school building is squeezed between the gully and the outermost street of a neighbourhood of modern, middle-class, mid-rise housing blocks. The children's entrance gate, however, is intentionally situated on the opposite side of the gully, in a small pine forest. While this lessens the nuisance of school-related vehicular traffic, it also requires children to undertake a short, daily promenade over a gully that is at times filled with roaring water. 'Children need daily exposure to nature, in all its facets, and this promenade ensures they get at least some', remarks Arturo Sanz, architect and partner of Gradolí & Sanz Arquitectes.

The school building itself is essentially a small two-storey terrace overlooking the gully and the pine forest beyond. When its second phase is completed later this year by the addition of a polyvalent entrance hall and an administrative office at the south end of the terrace, the building mass will appear to ascend out of the ground at one end, emulating the topography, while a subtle 'S' shape will generate two semi-enclosed courtyards facing east and west to offer options of sun or shade. In order to safely situate the school as closely as possible to the stream in both plan and section, a study

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The structural system of the school is made splendidly evident in the Catalan-vaulted ceilings in ground-floor classrooms (previous spread), in a networked series of beams and joists (opposite) and in the cantilevered balconies supported by angled tubular columns (right)

‘By appropriating and interacting with the school’s architecture, pupils are motivated by curiosity to learn independently’



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using three-dimensional digital simulations of worst-case scenarios, of one in 500-year flooding, was undertaken. With its relatively low profile and the origami topography of its extensive green roof, the school almost blends into the landscape when seen from the adjacent neighbourhood.

The 10 classrooms of the Imagine School correspond to different age groups and types of guided self-learning activities involving educational play, rather than to academic years. In a Montessori classroom, there are no blackboards or rows of desks, eliminating the proverbial front versus back of the classroom and the social divisions this reinforces. Not even the teacher – referred to as a ‘guide’ – has a desk. Instead, pupils usually convene at the beginning of the day in their classroom’s empty centre, seated on the floor, after which they engage in guided educational play by themselves or in small groups, sitting around tables arranged within different knowledge areas of a classroom, or even elsewhere, in or outside the building. The school offers plenty of nooks, crannies, alcoves and even hard-to-reach lofts and garrets for children to climb up or crawl into, along with conversation pits and an inside-outside amphitheatre for larger school gatherings.

The building functions not only as a facility for learning through play but also as a didactic component of the school’s educational programme, offering lessons to be learned through architectural observation and direct experience. Its structural system, entirely exposed inside and out, offers tangible lessons in the principles of statics as well as the qualitative behaviour of different materials. The masonry skeleton of the building, a series of vaults and load-bearing walls punctured by segmental arches, is a compendium of compressive forces (and a homage to Louis Kahn), while a mass timber system supporting folded gable roofs, mezzanines and balconies illustrates how a network of girders, beams and joists transfers loads to the bearing walls.

The beautiful Catalan-vaulted ceilings of the ground-floor classrooms were constructed without any formwork, out of a desire to experiment ‘hands-on’ with this regional building technique. The use of formwork, though not necessary in Catalan vaulting, minimises the risk of collapse during construction while controlling vault curvature with more exactitude. But aesthetic perfection was not the primary objective here. Rather, it was to see how this medieval vaulting method could be realised in a contemporary building. The architects calculated the structure themselves – as all architects in Spain are qualified to do, though many nevertheless outsource to specialists. On the upper level, the versatility of steel is showcased by a series of svelte vertical elements supporting timber

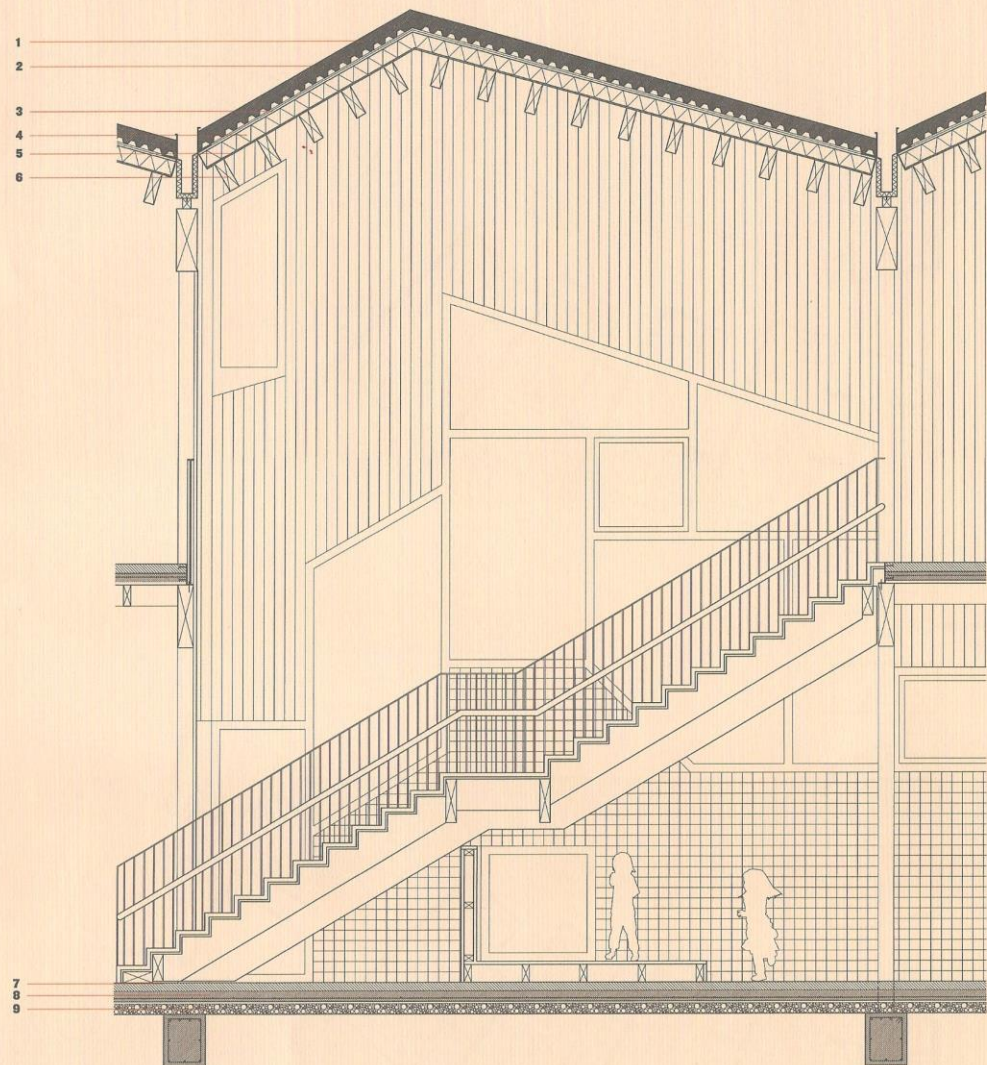


beams over which large balconies (one per classroom) are cantilevered; one end of each beam rests on a pair of angled tubular columns rising from the ground while the other end is suspended by a thin tension rod descending from a cantilevered roof girder.

The building’s rainwater management is similarly transformed into a visible, tangible educational experience. Rainwater is channelled by the geometry of the folded roof into downspouts that descend in front of each classroom but stop short of the ground plane, visibly discharging rainwater into the same drainage grates as the garden taps used by children to water plants. From here, water is delivered to an underground cistern, where it is saved for irrigating the green roof and the vegetable garden, repeating the cycle.

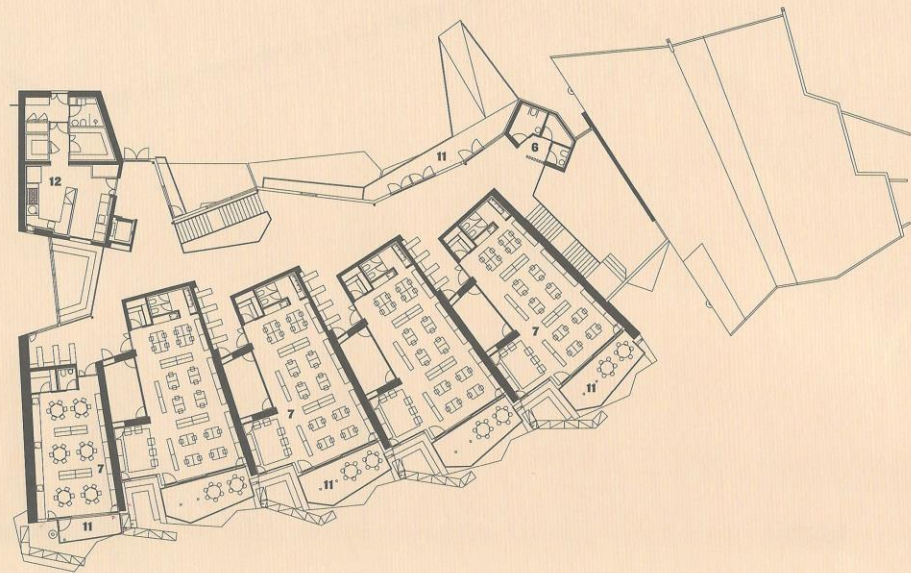
One of the plants cultivated in the garden, wisteria, is an essential component of the building’s natural heating and cooling system, shading the west-facing classroom windows in summer but letting sunlight through in winter, when leaves have fallen. The wisteria climbs up steel trellises suspended from the overhanging roof, alongside the drainage pipes and the thin steel supports of the balconies. Its visibly interconnected systems make the schoolhouse into an educational apparatus.

The fact that this open-ended building generously admits all sorts of educational paraphernalia, toys and scaled-down furniture (pupils even designed and fabricated a stackable OSB chair using CAD/CAM) speaks volumes about its built-in adaptability. Herman Hertzberger, whose Montessori schools are important precedents, is known to espouse an architecture of ‘making space, leaving space’ as well as a pedagogy of ‘learning without being taught’. Both of these notions are clearly observable at Gradolí & Sanz’s Imagine School: pupils are motivated by curiosity to learn independently. Far from presenting a static model of perfection, the school is open to multiple and different ways for young minds to self-learn. The school offers a place from which to embark on the adventurous learning journey that is life.

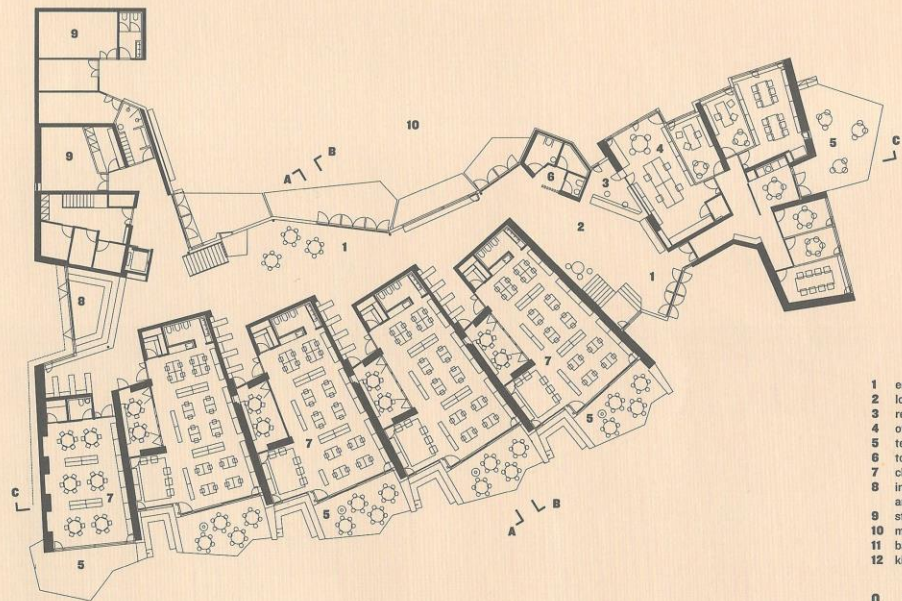


0 0.5m

- 1 green roof substrate
- 2 anti-root foil, geotextile membrane, drainage sheet, waterproofing sheet
- 3 waterproof board
- 4 natural cork insulation
- 5 spruce wood board
- 6 spruce wood joist
- 7 lime and recycled ceramic flooring
- 8 concrete floor
- 9 gravel fill

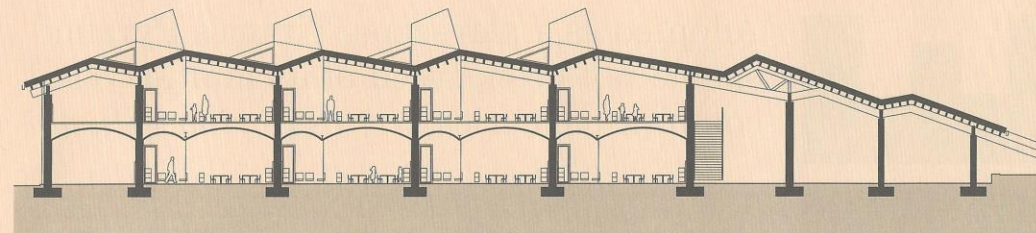


first floor

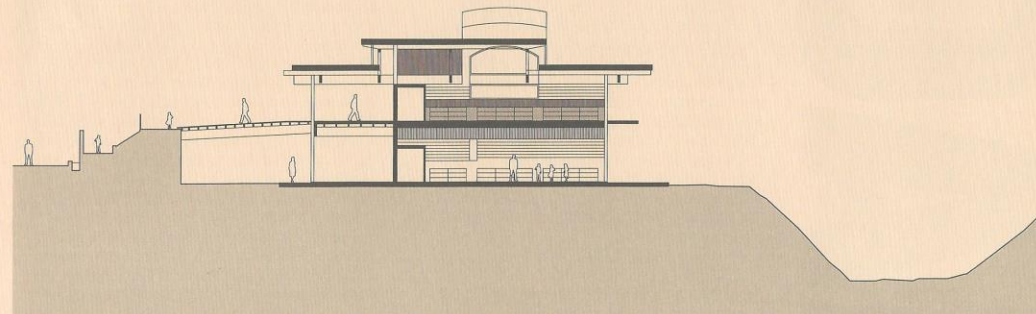


ground floor plan

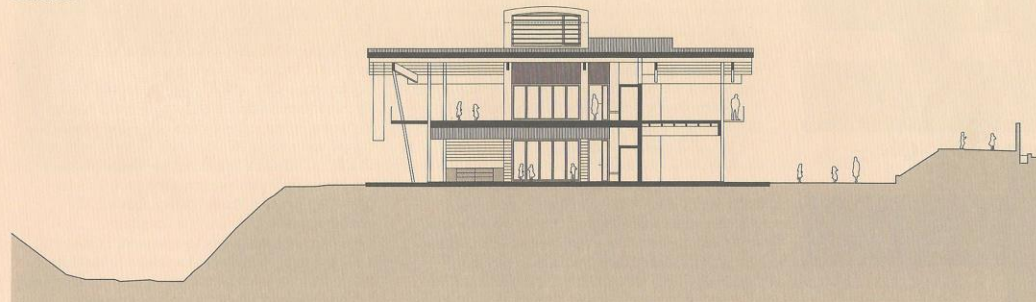
- 1 entrance
- 2 lobby
- 3 reception
- 4 offices
- 5 terrace
- 6 toilets
- 7 classroom
- 8 inside-outside amphitheatre
- 9 storage
- 10 main playground
- 11 balcony
- 12 kitchen



section CC



section BB



section AA



The first vault constructed for the project was able to support the weight of seven architects and masons as they posed for a photograph (left)

'The school offers nooks, crannies, alcoves, lofts, garrets, conversation pits and an inside-outside amphitheatre'