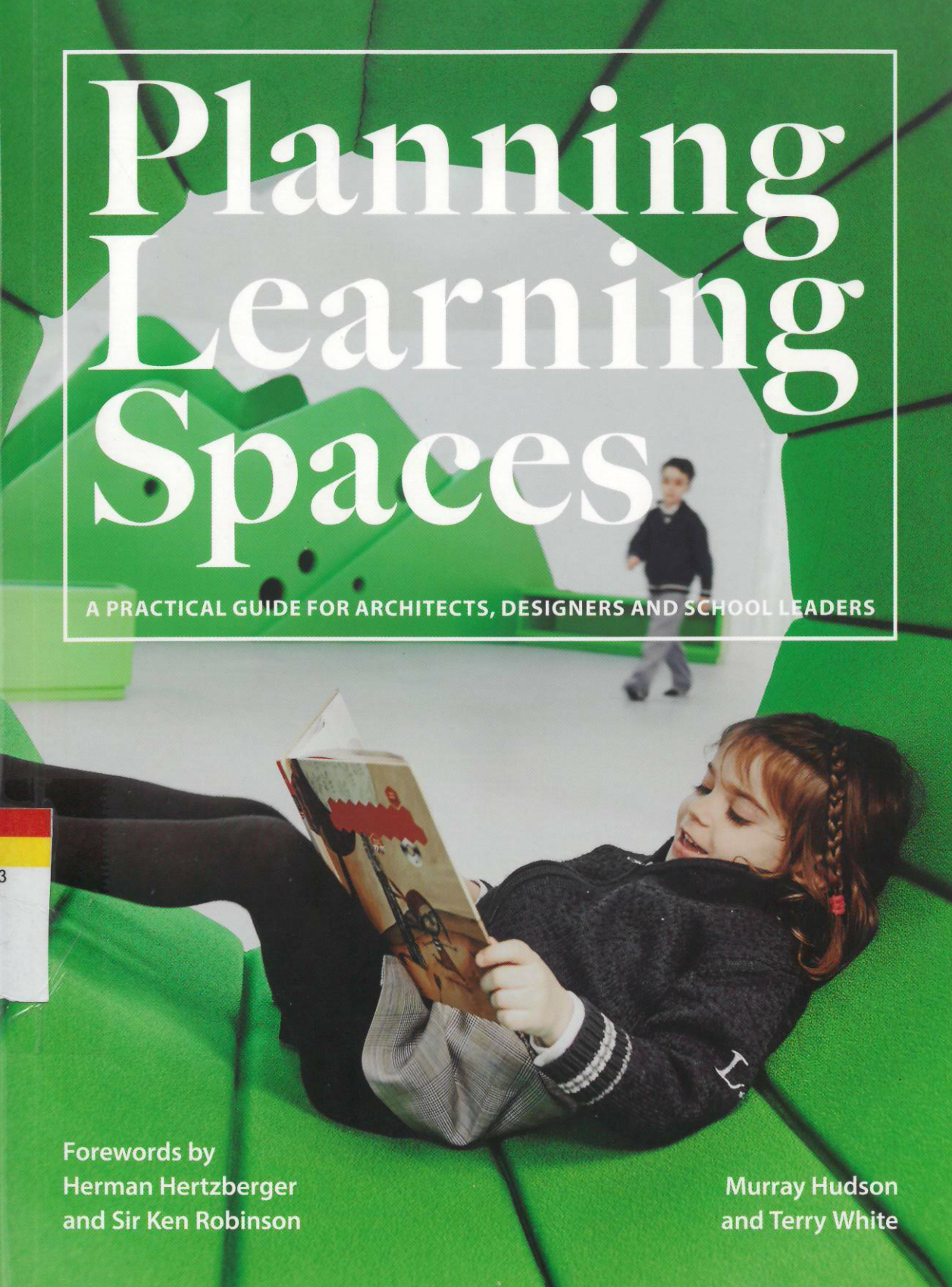
# Planning Learning Spaces

A PRACTICAL GUIDE FOR ARCHITECTS, DESIGNERS AND SCHOOL LEADERS



Forewords by
Herman Hertzberger
and Sir Ken Robinson

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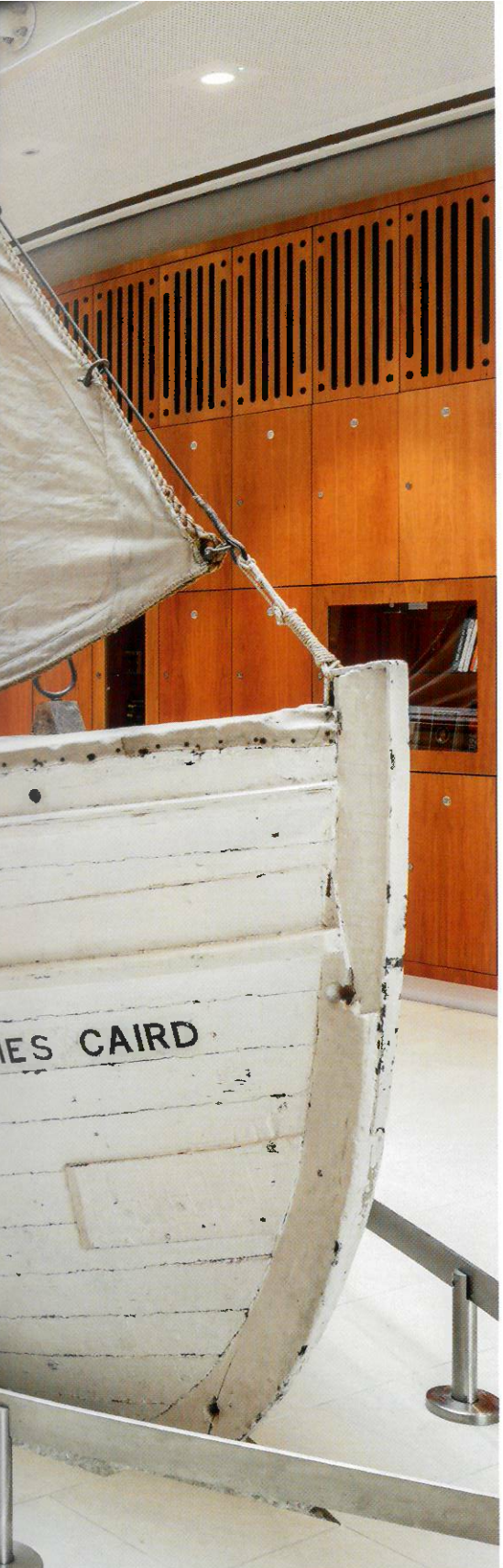


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## A PRACTICAL GUIDE FOR ARCHITECTS, DESIGNERS AND SCHOOL LEADERS

Murray Hudson and Terry White

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**Opposite**
Planning spaces for us

# A new approach for now

## Look around: global education is in a state of flux. Governments are urgently trying to educate the next generation for jobs that do not yet exist

Others understand that their future depends upon a workforce that is educated for an evolving world, and is able to adapt to ongoing change. What and how we teach are being hotly debated within countries and between continents. But do we talk enough about *where* we teach? Possibly not, but we should do.

Recent academic research has shown that the physical space in which children are taught has a direct impact on learning outcomes. In the UK, the recent Holistic Evidence and Design (HEAD) study, looking at 3,766 children in 137 classrooms from 27 very different primary schools, found that the physical characteristics of classrooms accounted for a 16 per cent variation in children's learning capabilities. This is significant and proves conclusively that the learning environment does matter.

Visionary educationalist Loris Malaguzzi famously described the classroom as the 'third teacher', next to pupils and teachers themselves. We have gathered evidence from around the world that establishes links between the design of the spaces in which young people learn and better learning outcomes.

Architects have much to consider when approaching a new school project: there are competing agendas – from politicians to parents; teaching methods are constantly evolving; technology is invading the classroom and other learning spaces; and there are financial implications to every decision.

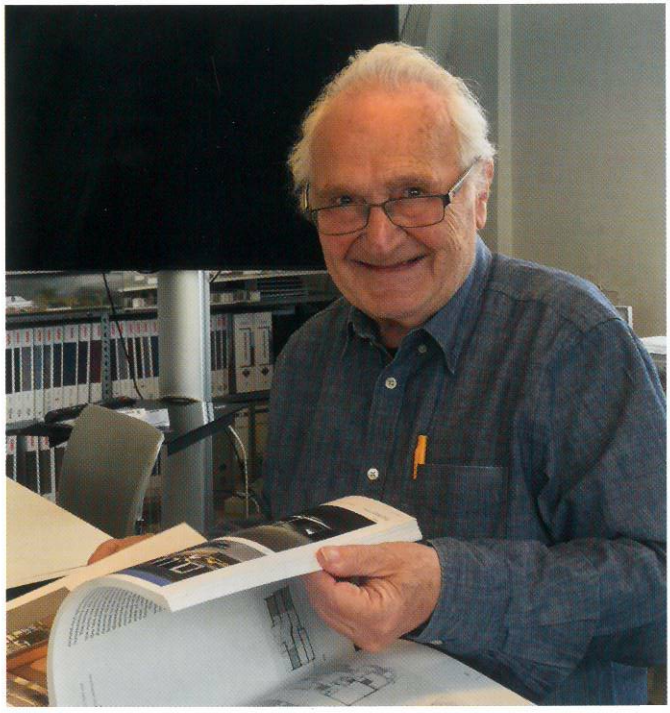
In this book we address the big questions surrounding the twenty-first century educational agenda and the learning spaces and buildings required to support it. To do this, we have assembled some of the finest educational leaders and innovative school architects to share their hard-earned wisdom. We have input from across the world – from Europe, the Gulf States, the USA and Australasia. We address the various issues that impact the design of school buildings.

We will show you how to get the basics – fresh air, light, heat and acoustics – right, while also considering sustainability. We reveal how to create a sense of belonging and engagement for all students, and provide an understanding of how furniture and technology interact with space. And we also address the intangibles of how schools must nurture the creativity present in all of us.

The advice contained is no-nonsense and practical. It does, however, require your thinking and engagement to determine the learning approaches and teaching practices that are fit for the twenty-first century. It is up to you to translate the advice into the design of exciting new projects. You can create inspiring learning spaces that empower the next student generation. Here's how.

*Murray Hudson and Terry White*

**Opposite**
A learning stairway.
Stephen Perse Foundation
School, Cambridge, UK



# Rethinking school design

## Designing schools may not be professionally glamorous, but the result has the greatest impact on our lives

Our characters as adults are rooted in the experiences we have as children, influenced in particular by our early built surroundings. As a child you need to be content both at home and at school in order to reach your potential. So, the onus is on architects, educators and parents to try to provide the best environments for children to develop both intellectually and emotionally. The design of schools is one of the most important areas of architecture, because it can have one of the greatest impacts on shaping lives. Yet, as an area of architectural practice, it has never received the attention it deserves. Maybe this is because it is not seen as professionally glamorous. This publication, however, like my own books over the years, seeks to correct this and to inspire the design of more intelligent learning spaces.

There are essentially two ways of educating people: one way is to tell them how the world works – a sort of 'this is how it is… so remember!'; the other way is to let people develop a capacity for thinking for themselves. I was lucky enough to have been educated at a time when there was the belief that children should be allowed to develop their own spirit. Today, I fear education is tending towards the opposite, and there's a return to an 'old school' style of teaching. As an architect who has spent his whole career designing schools, when I enter a learning space I can see at a glance what the pedagogical ethos of the place is just by looking at the layout of the classrooms.

The goal should be to create spaces that provide the best possible learning environment, where a child can feel safe, emotionally connected and intellectually stimulated. When I'm designing a school, it is always related to what people will do with it, what people will think of it. For me, form, space and people are absolutely complementary. I can't think of designing any another way. Fundamentally, successful school design is all about creating 'unofficial' spaces, which are not functionally defined but can be interpreted and owned by the people who use them. This means designing spaces that are adaptive, so that they can embrace inevitable change. One also needs to design the overall space so that areas intended for individual activity are in functional harmony with larger ones that bring people together.

Over the years, I have introduced features into schools that enhance navigation and create that all-important sense of place, such as islands, pits or grandstands. They provide orientation and domestication, both of which provoke feelings of familiarity and connection. This sense of attachment in turn enables children to take emotional ownership of a space, so it becomes their own place. In the end, the design of schools should centre on creating the feeling of homecoming. But more than this, you are also trying to give a child not only the feeling of home, safety and comfort, but also the desire and confidence to seek out new horizons, experiences and adventures.

I know from over 60 years of practice that the thoughtful planning of learning spaces can achieve these kinds of life-determining results.

*Herman Hertzberger*

# Building creativity into school design

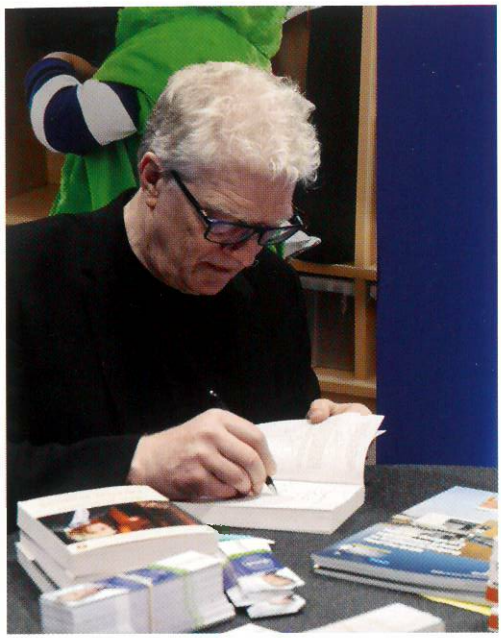
## Across the globe, there is a growing movement to transform education to help students to meet the real challenges of living and learning in the twenty-first century. Transforming education means reimagining schools

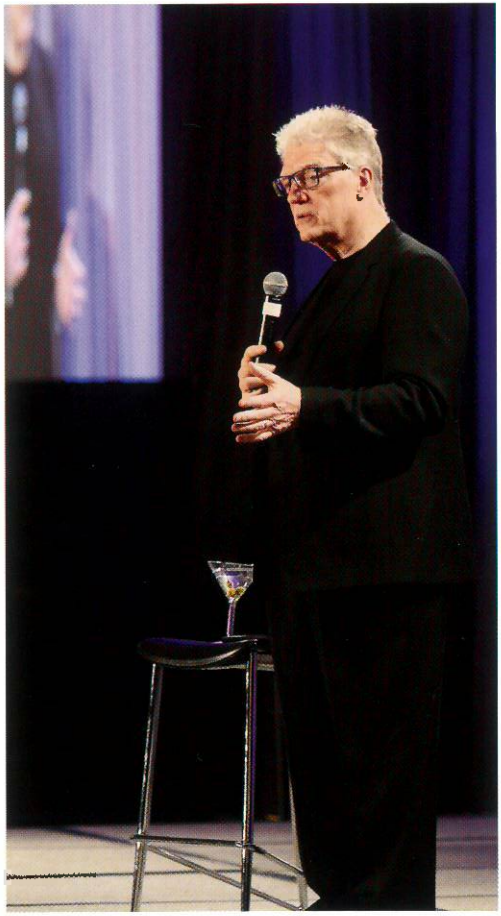
There are important differences between learning, education and school. Learning is acquiring new knowledge and skills; education is a planned programme of learning; a school is a community where education is meant to happen. Children love to learn; however, they don't always enjoy education, and some have serious problems with school. Those problems are often to do with the culture of schools, including the physical spaces they inhabit.

What is a school? A school is a community of learners: a group of people who come together to learn with and from each other. By 'culture' I mean a community's overall way of life. In schools as in other organized communities, culture includes *habits* and *habitats*. Habits are a community's characteristic forms of behaviour, and the values and purposes that underpin them; habitat is the physical environment the community occupies. In designed spaces, the habitat is meant to facilitate a community's habits, at least in theory. In practice, there is a constant osmosis between them. As Winston Churchill famously put it, 'We shape our buildings: thereafter they shape us.' Consequently, changing the culture of education also involves rethinking the spaces in which it happens.

Since the spread of mass education from the nineteenth century, schools have evolved into certain sorts of institutions with typical habits and habitats. Conventionally, children are educated by age groups in different types of schools, each with different sorts of 'age-appropriate' cultures. Typically, in the early years, children sit in circles and do practical things in groups; in later years they sit down, face the front and take notes. By then, the curriculum is often divided into hierarchies of separate subjects according to their supposed utility, and the day into specific units of time marked out by bells and transitions, for organizational efficiency. School buildings have been designed accordingly with separate classrooms and facilities to support these practices, which they then reinforce. Not all schools are like this and schools do not *need* to be like this at all. For a host of reasons, it is increasingly important that they are not.

In recent years, education has become a hot political issue – mainly for economic reasons – and the drive to raise standards has led to more standardization, specialization, testing, and competition between students, teachers, schools and even countries. For the most part, these strategies are not working, for





teachers, students or their families, and there is a pressing movement for change: a movement towards forms of education that facilitate curiosity, creativity, collaboration and a genuine love of learning. This movement recognizes that from the moment they are born, children are driven by a deep curiosity to explore the world around them. Compulsory education occupies the most formative years of their lives. From birth to adolescence, if the conditions are right, they undergo a dramatic metamorphosis: they develop physically, socially, cognitively, emotionally and spiritually. A balanced, dynamic education and great schools should provide equally for all of these.

The task of good school design is to create the best physical environment – the best habitat – for that to happen. For that reason, reimagining schools is one of the most creative challenges in contemporary education. As you are about to discover, this book is both a powerful inspiration and an invaluable practical resource for making that happen.

*Sir Ken Robinson*

# Transforming school design

## Schools, teachers and their pupils will have to adapt as the twenty-first century enters its third decade

Schools and local communities have the responsibility to prepare young people for both a local and a global future. We must, therefore, develop approaches to provide a truly twenty-first-century learning experience. These approaches must shape the design of the spaces and places where learning takes place.

In the introduction to its report 'What Makes a School a Learning Organisation?' the Organisation for Economic Co-operation and Development (OECD) stated: 'Today's schools must equip students with the knowledge and skills they'll need to succeed in an uncertain, constantly changing tomorrow.' And they observed what is universally recognized: '...many schools look the same today as they did a generation ago and they are not developing the pedagogies and practices required to meet the diverse needs of twenty-first century learners.'

The OECD described a learning organization as 'a place where the beliefs, values and norms of employees are brought to bear in support of sustained learning; where a learning atmosphere, learning culture or learning climate is nurtured and where "learning to learn" is essential for everyone.' In describing the development of learning organizations, the OECD has recognized the way in which the organization model has been adopted by many commercial businesses.

The OECD places student learning at the centre of its approach; it believes that schools need to be reconceptualized so that they can embrace innovation and organizational change, improve student outcomes for all students and appropriately prepare the citizens of the future. What is a school if it is not an organization with learning as its core purpose?

There is global acceptance that students now and in the future will need both knowledge and personal/social skills. We have a far greater understanding now of how the brain works and its relationship with the body. The importance of educational technologies to enhance learning, along with developing our understanding and application of artificial intelligence (AI), all have an impact on shaping learning futures.

Many of the contributors to this publication are 'thought leaders' interested in future learning; they share a passion for thinking about how we create and structure learning opportunities to meet the current and future needs of young people.

As Sir Ken Robinson, one of our esteemed contributors, observes, 'The fact is that given the challenges we face, education doesn't need to be reformed – it needs to be transformed. The key to this transformation is not to standardize education, but to personalize it to build achievement on discovering the individual talents of each child, to put students in an environment where they want to learn and where they can naturally discover their true passions.'

**Opposite**
Responding to a range of learning needs. Freemans Bay, Auckland, NZ

To achieve this, there is a need to move away from the polarized debates of the past that focused on a 'one-size-fits-all' approach to learning and teaching. The future must focus on making learning personal by fully engaging the young person, as an equal, in decisions about their education.

The graphic opposite, *Designing the Pedagogy of Space*, sets out many of the accepted trends that have been identified as influencing and shaping a twenty-first century learning experience. It is not a definitive listing, but it shows the importance of understanding the relationships between pedagogy, the intended curriculum experience, the organization of learning and teaching, and the design of learning spaces.

Personalized learning as a concept has become an established part of educational thinking and development over recent years. Practitioners have recognized the importance of actively designing and planning their teaching around the needs of students. The challenge is that this approach cannot always fully meet the needs of all students. This failing has often resulted in a process of teacher direction with a lack of student engagement in determining need, prior understanding and motivation.

In order to address this issue and engage with and respond to the needs of students, many teachers now work on a more collaborative basis with groups of students. This has created greater flexibility and engagement, opening up new ways of working with students and allowing them to enhance their learning. It also empowers the students to take advantage of a greater choice of where, when and how to learn, thus extending their personal control over the direction and style of their learning.

A curriculum of the past could be said to have been dominated by content coverage, directed by the teacher. The learning experience for the future must move towards a meaningful and creative world for the student, enabled by the teacher. An agenda for learning must motivate and engage, be inclusive and open to collaboration between the school and its community, and be relevant for all learners.

Educators, designers and all others involved in children's future learning must consider these trends when reimagining the design of spaces and places in which students and teachers learn and work.

## Designing the pedagogy of space: spaces to encourage creativity and movement

**PEDAGOGY CHANGES**

**Enable learners to see the wider context of their enquiries**

**CURRICULUM IMPLICATIONS**

Learning experiences relevant to real-life/world contexts

**IMPLICATIONS FOR DESIGN**

Global connectivity; subject adjacencies to improve collaboration; adaptable and reconfigurable space

**PEDAGOGY CHANGES**

**Responding to personal learning needs (academic and social)**

**CURRICULUM IMPLICATIONS**

Focus on individuals' skills and competencies to support learning

**IMPLICATIONS FOR DESIGN**

Spaces for students to work autonomously and receive peer and mentor support

**PEDAGOGY CHANGES**

**Modelling learning behaviours**

**CURRICULUM IMPLICATIONS**

Students and teachers share, plan and reflect on learning approaches

**IMPLICATIONS FOR DESIGN**

Adaptable space for pair and small-group work

**PEDAGOGY CHANGES**

**Collaborative learning**

**CURRICULUM IMPLICATIONS**

Group/team activity in which individual contributions are valued

**IMPLICATIONS FOR DESIGN**

Variety of spaces to promote team interaction and debate

**PEDAGOGY CHANGES**

**Enquiry-based learning**

**CURRICULUM IMPLICATIONS**

Investigation and exploration, responsive to student learning need

**IMPLICATIONS FOR DESIGN**

Spaces for researching and testing for individuals and groups

**PEDAGOGY CHANGES**

**Thematic and project-based approaches adding depth to learning**

**CURRICULUM IMPLICATIONS**

Interdisciplinary learning, exploring, creating and testing

**IMPLICATIONS FOR DESIGN**

Studio spaces, shared cross-faculty resource spaces

**PEDAGOGY CHANGES**

**Review, reflection and evidence-based learning**

**CURRICULUM IMPLICATIONS**

Access to, and availability of, data

**IMPLICATIONS FOR DESIGN**

Quiet, individual and paired spaces, appropriate infrastructure and acoustics

**PEDAGOGY CHANGES**

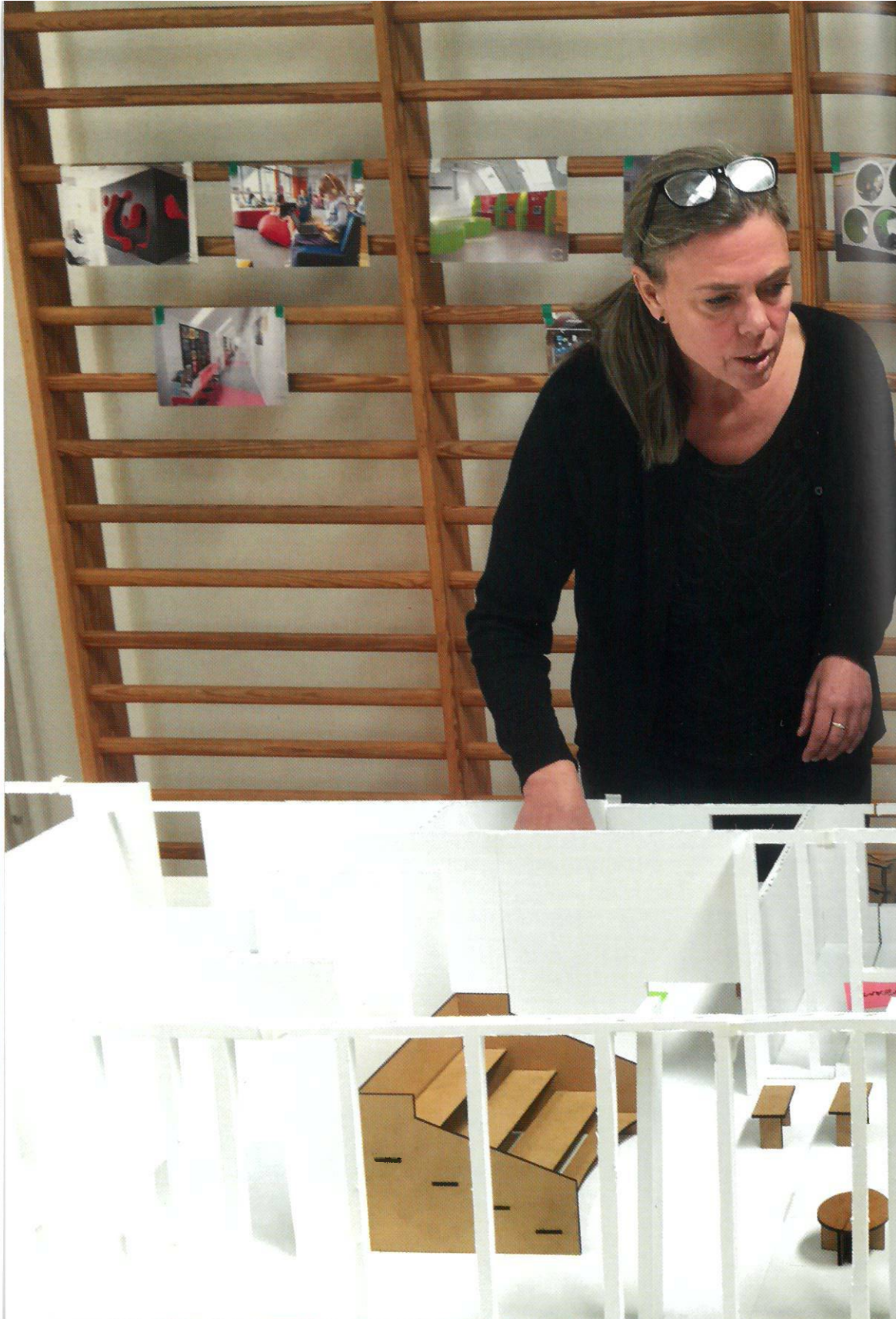
**Practical applications for learning**

**CURRICULUM IMPLICATIONS**

Practical exploration, vocational/industry experience

**IMPLICATIONS FOR DESIGN**

Appropriate spaces for facilitating work with external partners



# Crucial Choices

HOW TO APPROACH SCHOOL DESIGN

HOW TO BEGIN

HOW SPACE CAN PROVOKE LEARNING

HOW TO ENGAGE LEARNERS

## HOW TO APPROACH SCHOOL DESIGN

# Engaging a whole community is the key to developing a school that is fit for the future and reflects new ways of learning

Learning environments are exciting places to design. They are complex public buildings – often the first public buildings that young children will experience. They need to sit centrally and proudly in the community and provide a homely, nurturing space for students. The needs of twenty-first century learning mean that bringing these elements together has become more of a challenge. Architects are designing spaces that do not reflect the learning environment that they personally experienced, and are creating spaces for new activities that are yet to be fully developed or even imagined. New technologies constantly change the requirements of these spaces.

Just as students and teachers need to acquire new skills for the modern world, so too do architects. New ways need to be found to engage the whole school community. Learning environments around the world show that pedagogy, curriculum, society, staffing and politics all influence the design. There is no single template for the design of schools: designs need to respond to each school's unique ethos and context. However, one fundamental design element appears time and again: a rich variety of spaces that gives teachers and students greater choices in how they want to teach and learn. The right configuration of spaces can truly act as a catalyst for change, promoting the benefits of working collaboratively and creatively, letting students take ownership of their environment and helping school communities to deliver the curriculum in new ways.

Observation is a fundamental part of the design process. Designers must look at how spaces and resources are used and how a change of spatial arrangement could improve the learning environment, opening up new and unimagined opportunities.

The school experience is about 'growing human beings'. Schools are not only about learning and teaching but should also provide spaces that encourage young people to become engaged members of a community. The dining spaces must be pleasant and encourage discussion; locker areas should have good levels of passive supervision; and there should be sufficient space both within and outside the school for young people to make choices about how they spend their social time.

Discussing the learning environment will enable and encourage change within the school both for students and teachers. But change doesn't happen immediately, and the environment must not be too challenging for the school community who will need time to absorb and adapt to change. Transformation is therefore often effected by small steps.

Architects are partners in the creation of the new space and should challenge and stimulate dialogue around it. They should open the school community's eyes to the art of the possible; they are not there to write the education brief, but to respond to the school's requirements. Architects should take their time getting to know the schools they work with – not only the physical constraints, but also the culture and vision for the future. The people involved in the project may have

**Opposite**
The journey through school design. Bedales School Orchard Development, Hampshire, UK

## HOW TO APPROACH SCHOOL DESIGN

little experience of working with architects, so it is useful to develop a common language from the start – through conversation, visits to relevant buildings, and workshops.

It is important to consider, for example: What does innovation look like for this school? Do we all understand the meaning of hubs, pods and breakout spaces? Would it be useful to mock up a space to understand its size and how it may work? Is the school using the building project as a catalyst for change? Architects have found that in-depth focus meetings are a good way to engage a large number of people at once, for briefing and sharing initial ideas.

It is the architect's role to fully analyse the site and buildings, then respond to constraints and turn them into opportunities. Typical constraints that architects face may include the following:

- Budgetary: repurposing existing buildings often results in interesting learning environments and will create less disruption during construction.
- Topography: a sloping/stepped site can be used to create multiple levels, amphitheatre stairs and other outdoor learning spaces.
- Making the most of outdoor spaces: even in cooler climates, outdoor space should be an extension of the learning environment, as defined and varied as indoor spaces.
- Safety of pupils when working on occupied school sites: provided the safety of the school community is the top priority, a building programme can be a wonderful learning tool for the students and stakeholders.
- Poorly defined brief: while some schools believe they should arrive with a full brief, architects can get a deeper understanding of a school's requirements when they are part of the team defining the brief.

**Below**
Extending inside/outside learning. Royal Botanic Gardens, London, UK

## HOW TO APPROACH SCHOOL DESIGN


**Right**
Scale models can improve understanding of the space being designed

### Key considerations for the best learning environment

- Ensure 'buy-in' from all staff; without this the design will fail.
- Create a comfortable environment – get the basics right.
- Enable smooth, easy flow between spaces.
- Develop a common language between designers and staff; discuss what works and what doesn't. Agree on what changes need to be made to enhance a new way of learning, and the considerations of the individual school.
- Recognize the importance of undefined space (that is, not the classrooms, offices and so on) – the 'glue' where learning and socializing interact.
- Create mock-ups to test ideas before building them.
- Use all available tools to explain ideas clearly to the many people involved in the project, the majority of whom might not understand how to 'read' drawings, proportion or space.
- Visualize a day in the life of a student, teacher, parent and the leadership and support teams.
- Remember that the outdoors is as important as the indoors.

### Advice to designers

- Take time to research best practice from around the world and the opportunities provided by changing technologies.
- Spend time in schools observing the link between pedagogy and space.
- Develop your communication skills.
- Design environments that can be used in ways that were never imagined.

## HOW TO APPROACH SCHOOL DESIGN

### What characterizes the learning culture you are aiming for?

CONSCIOUS

**Artefacts**
Observable objects and behaviours

#### A typical example rooted in a 20th-century learning model

Sit down. Be quiet. Listen, and speak only when asked. Don't move around. Do what everybody else is doing.

#### Learning at Høsterkøb School, Denmark

Focus on the personalized task at hand. Find a place that works well for you. You can move around, work with peers and change your learning strategy if needed.

SUBCONSCIOUS

**Values and beliefs**
Not directly observable, but is experienced and understood from how people explain and justify what they do

We all learn in the same way and should learn the same things at the same time. The teacher is the main source of knowledge.

We have different needs and preferences that help us learn well. We learn at our own pace and can help each other learn.

Based on Edgar Schein, Organizational Culture

HOW TO BEGIN

# Before you begin, understand that learning spaces are an expression of a learning culture and design them to strengthen that culture

Open a classroom door, and you will often find around 25 identical desks. That's 25 identical work stations for 25 different students, all of whom have different needs and preferences. They will all be at different stages in their learning, and with different life paths ahead of them. The learning culture expressed through this layout and choice of furniture doesn't meet the needs of twenty-first century learning. Yet, this teacher-centred model of instruction has become the predominant one driving school design.

Research clearly shows that lecture-style teaching is one of the least effective ways for students to learn. As a general rule, a student is able to pay attention to and recall what is being said for the same number of minutes as his or her age. This means that the amount of time that a student in a class will benefit from this style of teaching will be between 5 and 15 minutes at the most. And yet, currently, most classrooms are designed for this type of instruction. Instead, classrooms should be designed for the way we know learning works, and for nurturing those skills and competences that are needed today.

Be conscious of the power of spaces in shaping actions and behaviour. Spaces affect the way we think, feel and act – and this obviously applies to students and teachers. A classroom laid out in rows sets the scene for a traditional teacher-centred instruction. To prepare young people for the future will require new approaches to learning and teaching. To meet young people's individual needs, learning must be more engaging, relevant and personal. Do our spaces communicate and encourage what we wish to see in our schools?

A helpful model to analyse and reflect on spaces in schools is based on Edgar Schein's model of organizational culture (opposite). Consider the characteristics of the learning culture that are implicit in the design and organization of space.

What do teachers want when it comes to school and learning space design? They first and foremost want their ideas and thoughts to be heard. And when the spaces are conceived collaboratively, learning spaces can become inclusive, welcoming environments that support learning and well-being for all children.

## The fundamental conditions of the space

The fundamental conditions of the space – good acoustics, a positive atmosphere, natural light and a choice of materials and colours that help to communicate the values of the school – are of huge importance. To create a welcoming place you must consider the layout, the range and the style of furniture that is provided for students. For example, focused light in a larger space creates the illusion of separate smaller spaces, which in turn helps to increase concentration and lower noise levels.

## HOW TO BEGIN

### Designing for learning – creating functions and zones

Learning spaces should reflect the learning activities as well as offer a choice to students. Zones should be designed for different functions:

- Instruction and presentation.
- Collaboration.
- Quiet study.
- Creative production.
- Social interaction.
- Access to the external environment.

Different age groups, different cultures and different countries may require additional zones. For example, in Denmark physical movement is an integral part of learning so zones for movement and play would be integral to the design.

**CONSIDERATIONS**

- Teaching staff should be included in key discussions.
- There should be a focus on the shared vision, values and learning philosophy.
- What are the long-term goals?
- Engage with the students. What works for them? What different needs do they have?
- Consider and respond to individual learning needs (academic and social) in the planning.
- Be clear about the why, the how and the what of the learning space design.
- Review appropriate research.
- Ensure stakeholders are engaged and invested.
- Use inspiring examples to develop collective thinking.

## Crucial choices – what should be the initial focus?

A great learning environment is the physical representation of a well-functioning learning culture – the values, beliefs and pedagogical practices shared by teachers and students. When spaces and culture are in harmony, the spaces actively support learning and thus support the goals of the school.

The design should be driven by the learning philosophy, and the initial areas for questions the architect should ask are as follows:

### 1. Vision and values

Understand the school's values, beliefs and desired future pedagogical practices. This is the basis of the vision for the future. This is a collaborative process, so involve as many teachers as possible.

- Where does the school want to be in 5, 10, 15 years' time?
- What legacy does the school want to leave?
- What does learning ideally look like, and how are the roles of both students and teachers changing?
- How best can the students be supported?

Use inspirational examples – from the field of education or otherwise. Be aware of neurology and learning research.

### 2. Pedagogy and activities

The next step is to establish how learning should ideally take place.

- What activities should be happening?
- What functions are needed by teachers and by students?
- How are learners' needs being met?
- What choices are being provided for the students?
- How should the students feel and how should they be encouraged to act?

These questions help to focus the conversation around pedagogical practice that can later be interpreted into physical forms.

It is beneficial at this point to engage with the students and ask:

- Where and how do they feel they work most effectively, both at school and at home? And why?
- What do they prefer to do during breaks?
- In what type of environment are they most comfortable?

### 3. Organizing learning

Next clarify who needs to work with whom and when, in order to establish the general layout of the learning environment.

- How will group sizes vary throughout the day?
- How should the different functions and groups be organized?
- Will students be organized by class, year group or otherwise?
- How should areas be integrated with each other?
- Will there be classrooms, or a more flexible open or semi-open learning hub?