Designing Buildings for the Future of Schooling

Contemporary Visions for Education

Edited by

Hau Ming Tse, Harry Daniels, Andrew Stables and Sarah Cox

DESIGNING BUILDINGS FOR THE FUTURE OF SCHOOLING

Bringing together leading experts from the fields of architecture, design, engineering, education and the social sciences, this valuable collection presents a multidimensional understanding of the complexities and ways in which school designs influence and are influenced by educational practice.

Moving beyond the long-debated question as to whether the design of a school influences pedagogic practice, chapters acknowledge the multiple and diverse ways in which teaching, learning, development and inclusion are impacted by the nature and quality of the physical environment. Considering changes in national and international policy, and exploring the changing pressures and demands on design, education and schooling more broadly, contributors rethink and re-envision those aspects of design and educational practice in which they specialise. Together, these chapters present a bold vision for the future conceptualisation, development and use of school buildings and facilities.

An important contribution to debates on school design and education, inclusion and pedagogy, this is an essential and fascinating read for students, researchers, lecturers and policymakers involved in the fields of education and architecture.

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Harry Daniels is Professor of Education in the Department of Education, University of Oxford and holds visiting professorships at Griffith University, Moscow State University and Kansai University. He specialises in the development of post-Vygotskian and activity theories and studies learning across a wide range of domains from these perspectives. His current research focuses on the relationship between design and practice.

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directly influenced, for example, the UK Department for Education, the US Green Building Council and the Norwegian Education Directorate.

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Peter Clegg is regarded as a key pioneer in environmental design. He has more than 30 years' experience in low-energy architecture and is actively involved in research, design and education. Peter works primarily in the education and cultural sectors. He has led projects at Yorkshire Sculpture Park, London's Southbank Centre, Brighton Dome and the new Leventis Gallery in Cyprus. His active involvement in schools and higher education projects includes a new School of Engineering in Toronto and an academy in Bangladesh. He is Chair of the RIBA Awards Panel, the SWDRP, holds a professorship at Bath University, and in 2010 was made an RDI.

Hannele Kerosuo works as the senior researcher at the Centre for Research on Activity, Development and Learning (CRADLE) located at the Institute of Behavioural Sciences of the University of Helsinki. Her current research focuses on the management of BIM-based building projects and the development of knotworking in the collaboration between architects and design engineers in building design. Her previous activity-theoretical studies are related to

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Joe Jack Williams is an engineer with an MEng from University of Surrey in Mechanical Engineering. Following a career as a building services consultant, he moved onto to study an EngD at The Bartlett, UCL with support from Feilden Clegg Bradley Studios, including an MRes in Adaptive Architecture and Computation. Joe's EngD focused on the influence of the school building on the students within, with a high-level study examining the performance of the BSF programme as well as a detailed holistic study of four schools measuring perceptions, environmental performance and building forms using space syntax. Joe currently works as a researcher within Feilden Clegg Bradley Studios, developing and enabling research across the practice, and as an associate lecturer within Oxford Brookes University's architecture department, teaching environmental design to architecture students.

INTRODUCTION

Hau Ming Tse, Harry Daniels, Andrew Stables, and Sarah Cox

We have been working together for six years. We come from different backgrounds. Hau Ming is an architect, Harry is a social scientist, Andy is a semiotician and Sarah is an educational researcher. These different backgrounds have given rise to a multidimensional understanding of the complexities of the ways in which school designs influence and influenced by educational practice. Our main Arts and Humanities Research Council-funded project was entitled *Design Matters?* This gave us the opportunity to examine in depth the design and occupation processes in different designs with different pedagogic practices over time. During the course of the research project we established an international network of key stakeholders in the field of school design. We have benefitted from conversations with architects, engineers, commissioners, policymakers, head teachers, classroom teachers, parents and students. Towards the end of the project we convened a multidisciplinary symposium at the Department of Education, University of Oxford on 22 June 2016. This symposium took place at a time when policy on school building in England was radically different from the policies that created the case study schools we studied. The move to reduce the input of designers into the process and consultation with school communities, alongside reduction in budgets and the roll-out of standardisation, had caused something of a furore. Importantly, this policy shift also gave rise to debates about the very nature of schooling. All these issues feature in this book. These debates establish the remit of the book and set it in the context of national and international aspirations, pressures and demands on the future of design in the practice of schooling and education more generally.

As the title suggests, the *Design Matters?* project sought to answer the question as to whether the design of the school really did make an impact on pedagogic practice and their impacts. The relationship between design and educational

practice has a contested history with suggestions that design alone can change behaviour locked in conflict with those that suggest that it has little or no impact. Neither argument has developed a sophisticated model of the relationship between the two. There has been recognition of the complex nature of the influences that are brought to bear on design and on the nature of the knowledge that is needed for design to 'work':

> The struggles to agree upon what counts as design knowledge and its cultural identity can therefore be perceived as affecting and being affected by a complex system involving economy, production, social significance, consumption, use of objects, and so on.
>
> *(Carvalho & Dong, 2006, p. 484)*

What counts as acceptable design knowledge changes over time, sometimes very rapidly. In England between 2003 and 2010 there was considerable government interest and investment in designs that aimed to provide inspiring learning environments and exceptional community assets over an extended period. The intention was to ensure that "all young people are being taught in buildings that can enhance their learning and provide the facilities that they and their teachers need to reach their full potential". The design process was to involve "proper consultation with the staff and pupils of the school and the wider community" (DfES, 2002, p. 63) in order that "authorities and schools will be able to make visionary changes and enable teaching and learning to be transformed" (DfES, 2003, p. 7).

The initiative involved the decentralisation of funds to local education partnerships that were required to build and improve secondary school buildings as well as to coordinate and oversee the educational transformation and community regeneration that was envisaged:

> The aim is not just to replace crumbling schools with new ones, but to transform the way we learn. This represents a break with the old way of doing things and should change the whole idea of "school", from a physical place where children are simply taught to one where a community of individuals can share learning experiences and activities.
>
> *(CABE, 2006, p. 1)*

Aspirations for the outcomes of the programme, known as Building Schools for the Future (BSF), were couched in terms of collaboration between schools; the development of new forms of infrastructure; new models of school organisation; an enhanced teaching force; new patterns of distributed leadership; personalised approaches to teaching and learning, involving significant and novel use of information and communication technologies (ICT); and new forms of central governance.

The term 'personalisation' was a common feature of many policy documents and, although it was linked to a myriad of meanings, generally became associated

with shifts in modes of control over learning, with students taking more responsibility for the selection, sequencing and pacing of their work in school. The personalised approach was to be made feasible through access to new technologies and the availability of a mixed economy of open and flexible spaces. The argument promoted in favour of this significant investment was couched in terms of transformation of learning and teaching along with enhanced participation and community involvement and engagement. Sustainability was a major consideration, especially with respect to energy usage.

Considerable emphasis was also placed on the need for new approaches to school leadership:

> Our determination is to ensure that every Head is able to do more than run a stable school. Transformation requires leadership which: Can frame a clear vision that engages the school community; Can motivate and inspire; Pursues change in a consistent and disciplined way; and Understands and leads the professional business of teaching. To achieve their full potential, teachers need to work in a school that is creative, enabling and flexible. And the biggest influence is the Head. … Heads must be free to remodel school staffing, the organisation of the school day, school week and school year and be imaginative in the use of school space – opening up opportunities for learning in the community, engaging with business and developing vocational studies.
>
> *(DfES, 2002, p. 26)*

However, as Kraftl (2012) points out, there is some doubt as to whether this radical vision of restructuring was realised in the realities of practice in schools and communities:

> BSF connected with the promise of three further discourses: school (-children), community and architectural practice. It anticipated that new school buildings would instil transformative change – modernising English schooling, combating social exclusion and leaving an architectural "legacy". However, it is argued that BSF constituted an allegorical utopia: whilst suggesting a "radical" vision for schooling and society, its ultimate effect was to preserve a conventional (neo-liberal) model of schooling.
>
> *(Kraftl, 2012, p. 847)*

More recently, the subject of design quality in schools has come to the fore with government pronouncements on the wastage of money on architectural fees and what has been referred to as overindulgent design within the BSF programme. The architectural profession has responded that they had been asked to produce higher quality environments particularly in terms of the acoustic environment, the quality of daylighting and higher quality ventilation, the provision of ICT and the reduction in energy costs. Some buildings may prove extremely good

value for money in terms of their impact on the educational achievements of their pupils; others may not.

The policy environment in which the schools we studied were located was one in which capital investment was made in order to secure radical change in the practices of schooling. Teaching, learning, management and community participation and engagement were to be transformed as new schools were designed and built to meet the envisaged needs of the 21st century. More recently, policy on the role of design in rebuilding the schools' estate in England has been through another major change as attempts are made to achieve good value and efficiency in times of austerity. In 2010, the BSF programme was scrapped. The Priority School Building Programme (PSBP) was established in 2011 and intended to reduce school building costs by approximately a third in comparison with those incurred during BSF. Project time has also been reduced from 24–36 months to 12 months in order to drive efficiency. This involves limiting consultation with school communities and multiple stakeholders to an initial six-week period. So-called "Control Options" were produced in order to demonstrate how a very limited number of "Baseline Designs" should be applied in practice.

> Good quality education does not necessarily need sparkling, architect-designed buildings…. Throughout its life [BSF] has been characterised by massive overspends, tragic delays, botched construction projects and needless bureaucracy.
>
> *(Gove, as cited in Kraftl, 2012, p. 866)*

Some time ago, Earthman (2004) concluded that while inadequate school buildings cause health problems, lower student morale and contribute to poor student performance, he was not convinced that school buildings need necessarily be any more than adequate, although the notion of adequacy fails to find a satisfactory definition. A recent review conducted by OECD (2013) sought to identify how "investments in the physical learning environment" – that is, "the physical spaces (including formal and informal spaces) in which learners, teachers, content, equipment and technologies interact" – can translate into improved cognitive and non-cognitive outcomes (p. 1). In order to do this they explored set the ways in which spatiality, connectivity and temporality mediate pedagogical and other relationships that can improve student learning. The emphasis here on mediation is important. It suggests a very different mechanism is at play than one of determination. They recognised that empirical evidence was far from extensive and agreed with Woolner et al. (2007) that

> The research indicates that there is an overall lack of empirical evidence about the impact of individual elements of the physical environment which might inform school design at a practice level to support student achievement.
>
> *(Woolner et al., 2007, p. 47)*

More recently however, Barrett et al. (2015) have suggested that differences in the physical characteristics of primary school classrooms explain 16% of the variation in learning progress. Their claim is that theirs is the first study in which clear evidence of the effect on users of the overall design of the physical learning space has been isolated in real-life situations. Their findings point to a classroom (rather than a whole school) design effect:

> Surprisingly, whole-school factors (e.g. size, navigation routes, specialist facilities, play facilities) do not seem to be anywhere near as important as the design of the individual classrooms. This point is reinforced by clear evidence that it is quite typical to have a mix of more and less effective classrooms in the same school. The message is that, first and foremost, each classroom has to be well designed.
>
> *(Barrett et al., 2015, p. 3)*

A more comprehensive view is argued by Sailer and Penn (2010, p. 12), who claim that

> Humans shape their buildings through design practice (social agency affecting spatial structure); humans shape their organisations through management practice (social agency affecting social structure); then buildings shape organisations (spatial agency affecting social structure); both organisations as well as buildings constrain agents in their behaviours (social structures and spatial structure-agency affecting social agency).

This complex, dialectical view of the relationships between buildings and human actions (including management, social organisations and social structures) informs the way schools, their designers, constructors and occupiers should be studied.

In summary, this moment in time gave rise to questions about the future of schooling itself and the extent to which the design of schools was fit for the purposes of these new educational visions. Interestingly, at the time when English policy shifted away from the early 21st-century arguments about design and practice, much of the rest of the world continue to pursue debates about radical restructuring of education and design in order to meet the demands of a world that was being restructured through new conceptions of work and communication. In some cases, this led to processes of rethinking the underlying capabilities that education should seek to promote. In the case of Finland, with its much-publicised records of excellence in international measures such as Programme for International Student Assessment (PISA), a case was made for the centrality of imagination and creativity and critical thinking as the core capabilities that were essential in the development of a strong economy and a stable and cohesive society. The Finnish system provides a clear example of an attempt to reconsider the validity of assumptions about design and practice that prevailed for

much of the 20th century. In this book, we have encouraged our contributors to engage in a process of rethinking and re-envisioning those aspects of design and educational practice in which they specialise.

In the first chapter, Tim Brighouse tackles the thorny issue of the future of schooling itself. He identifies two tasks for schools, first in how to improve what they decided to do, and second, in deciding what they do. Tim has a long history of a profound contribution to the development of practices through which schools can improve themselves. This is witnessed in his chapter. Importantly, he asks questions about the ways in which schools should and could change their focus in the coming years. His suggestions take the form of a plea for a broader set of national purposes of education, a reformed curriculum and assessment process, a rethinking of accountability arrangement and reconsideration of the relationship between schools and local and national authorities. He makes a powerful case for a reconsidered future and provides thought-provoking ideas, which we believe should fuel forthcoming debates.

Gert Biesta broadens the debate beyond the issue of how design affects 'learning'. Biesta argues that education involves far more than mere learning: it is a deeply value-laden process involving difficult choices about what should (as opposed to what can) be learnt. Furthermore, schools have multiple responsibilities beyond the mere training of students to pass examinations. Rather, school is a much more complex process of socialisation and personal growth than is often realised, and design can play multiple, not always consistent roles in challenging as well as simply enabling students. Biesta's understanding of schools as (potentially) educational organisations stems from the German tradition, in which *Bildung* is a much richer process of growth into culture, society and self-determination than is recognised in more narrowly instrumental Anglo-Saxon conceptions of the purpose of schooling.

Peter Clegg and Joe Jack Williams examine how rapid changes in government policy since 2000 in England have shaped the architectural debate on school design. Feilden Clegg Bradley Studios has a unique and insightful perspective from developing a growing body of research through working in practice. Clegg and Williams analyse the impact of policy on the design and production of school buildings using practice data through time. They argue that that in times of austerity, the "value" and purpose of school buildings should be carefully considered in terms of long-term flexibility, sustainability, quality and ability to adapt to future changes in pedagogic development and curricula. Clegg and Williams importantly discuss the key lessons learnt from over 25 years of designing, building and rethinking school environments for the next generation of learners.

Kerstin Sailer derives much of her influence from theories of space syntax. She draws on Bernstein's (1971) sociology of pedagogy in a discussion of school buildings as pedagogical tools. She draws on a distinction between open and closed schools, which lies at the heart of the differences that are to be seen in a comparison between the English initiatives of the period from 2003 to 2010 and those which followed in the wake of the change of government in 2010.

Of course, this open and closed distinction is not new. In the United States and in parts of the UK, the 1970s witnessed the development of so-called 'open plan' schools. Arguably, these were rather crude and unnuanced attempts of breaking out of the well-established formulae of school design. In this chapter, space syntax is deployed to provide a much more sophisticated and theorised approach to the configuration of space. Five examples are given of school designs with elements of space syntax analysis. She places a particular focus on the design of corridors as a way into debates about the ways in which space is configured. In so doing, she challenges simplistic notions of 'open' and 'closed' and opens the ways for new understandings of configurational analysis.

Peter Barrett and his colleagues have, for some years, looked not at the effect of school design as a whole, but rather at the particular effect of classroom design on learning outcomes. Drawing on an extensive data set, they argue that certain aspects of classroom design have a very significant effect on student outcomes. Barrett's approach will be controversial for some, as isolating variables and quantifying their effects in contexts such as this is always open to challenge. Also, some may feel that by putting the traditional classroom at the centre of the analysis, Barrett is reinforcing a very traditional model of schooling that initiatives such as BSF were intended to challenge. On the other hand, Barrett and his colleagues have used a sophisticated and rigorous approach and have shown a clear design effect. Perhaps the focus on the classroom is simply realistic rather than reactionary; certainly, the *Design Matters?* team found very limited evidence of teaching approaches other than those centred firmly, and often very traditionally, in classrooms. Barrett is one of few researchers fully to acknowledge this.

Designing and building a school is by very definition a multi-agency activity. There are clients, architects, engineers, constructors and many others who are involved in what is often a rapid-fire series of consultations and actions. Unfortunately, the construction industry appears to struggle with processes of inter-agency collaboration. In her writing, Hannele Kerosuo discusses new developments in multiparty collaboration between clients, users and designers in school design. She draws on the Finnish approach to what has become known as Cultural Historical Activity Theory as developed by Engeström and his colleagues in Helsinki. A new tool known as Building Information Modelling technology (BIM) has been introduced and widely adopted as attempts are made to improve collaboration between different players in the field. This chapter both theorises and reports empirical studies of the introduction of BIM into new ways of working in the construction industry. She questions whether the kinds of collaboration she feels are essential, which she refers to as knotworking, can and will result from the introduction of a technological tool in the form of BIM.

Dejan Mumovic, Lia Chatzidiakou and Riham Ahmed examine the environmental performance of school environments through an evaluation of the strength and consistency of current evidence indicating that there is an association between students' performance and indoor pollutants and thermal conditions in schools. This chapter brings together three research projects at the University

College London (UCL) Institute for Environmental Design and Engineering analysing different environmental factors that impact students' health, cognitive performance and comfort. This evaluation offers important evidence-based guidance for school designers, educationists and policymakers on the environmental factors that support healthy, comfortable school environments for students. This chapter also points to the need to develop a holistic, multidisciplinary approach to environmental quality, energy use and educational performance in order to have a better understanding of the complex relationships between environmental performance, pedagogic practices and occupants' perceptions of their school environment.

Jill Porter opens the door on a very important but rather neglected area of debate concerning school designs. She considers the implications of design for young people with a range of strengths and needs. She points out that much of the research that has been carried out focuses on specific special needs and/or disabilities, and that relatively little work has been done of the implications and experiences of design for a much wider constituency of young people who may experience difficulty with and in schooling.

Her analysis includes an examination of the guidance that has been offered and how this has changed over recent years as the focus has shifted more towards the design of special provision. She identifies limitations in current versions of what is often called 'inclusive design. Her plea is for a much more nuanced and subtle engagement with a complex and challenging set of dilemmas that inclusive design presents. She presents a strong case for further engagement with these dilemmas in the pursuit of a fair and just approach to the design of learning environments for all pupils.

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