

Chapter 7

Design as a Social Practice

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Abstract: In this chapter we present the findings of an investigation into the ways in which the discourses and practices of school design produce educational spaces which influence the discourses and practices of teaching and learning when the building is occupied. This investigation involved the development of a methodology for systematically analysing the relationship of school space to the experiences of students, teachers and parents. It expands notions of post occupancy evaluation (POE) research by exploring how the motives of an educational vision which informed an initial school design, those of the final build, and those of the people who occupy that building interact in a way which influences experiences of the end users. In this way we sought to understand more about the extent to which a building regulates or governs the behaviour of those who occupy it. Through our approach to multi-professional post occupancy evaluation we came to the view that a building may be understood as a tool which may be used to facilitate change rather than as an instrument of change.

Introduction to the research background

In this chapter we will discuss our multidisciplinary approach to Post occupancy evaluation (POE). Our argument will be that this area of study must attend to the mutual shaping of design and pedagogic practice through time. The UK Arts and Humanities Research Council funded *Design Matters?* project examined the influences that are brought to bear on the design of school buildings and the effects the designs have on those who teach and learn in them. It was conducted in English schools by a multidisciplinary team of 5 researchers from the Universities of Oxford and Roehampton during the period 2013 -2017. Our project sought to understand how and why the educational vision of new schools built under the Building Schools for the Future (BSF) and Academies programme came to fruition and how the vision translated into the final designs. The BSF programme was initiated by the then Labour Government in 2003. It also investigated the ways in which designs are altered in and through the practices of occupants.

Post Occupancy Research

POE research is typically aimed at measuring the performance of environmental factors such as lighting, temperature and acoustics (e.g. Hygge, 2003; Galasiu&Veithch, 2006; Winterbottom & Wilkins, 2009;

Shaughnessy, Haverinen-Shaughnessy, Nevalainen, et al, 2006) with the intention of informing architects, educators and policy makers on what type of building creates optimal learning conditions in relation to such factors. Many environmental POE's only contain quantitative data and tell us little about how different environmental factors interact dynamically with users through time and the consequences of these interactions (Tse et al, 2014).

The work of Burke & Grosvenor (2008) does provide insight into how school buildings can mediate students' perceptions of who they are, what they should think about the world, expected ways of behaving and feelings of well-being, thus developing Churchill's claim that '*First we shape our buildings; thereafter they shape us*'. However, it is this 'shaping' process which is less frequently researched (e.g. Price, Clark, Holland et al, 2009: p.19) even though 'direct and psychosocial influences are apparent on all school users' (Ibid: 19). The limited research in this area also fails to offer a systematic analysis of how space is shaped (Woolner et al, 2007) and, to our knowledge, there is no research, which explores how space is shaped from the inception of a design idea through to occupation and the mediating effects of the spaces on end users post occupation through time.

Current architectural research on school environments tends to focus on environmental performance in terms of factors such as natural daylight, air quality, temperature, and noise level. Woolner et al. (2007) warn that such research in isolation can lead to confusing, and often contradictory, conclusions; however, they also acknowledge that inadequate temperature control, lighting, air quality and acoustics have detrimental effects on concentration, mood, well-being, attendance and, ultimately, attainment. Such research is therefore relevant, but educationally limited. By contrast, Moos (1979) argued that the learning environment is best understood as resulting from a complex interaction of social, cultural, organisational and physical factors. Benito (2003) directed attention to the meanings of school design and the cultural function that is assigned to schools. From this perspective school architecture should be open to a form of analysis, which takes account of educational discourses and practices, and actors' social norms. Cooper (1981) examined the conflicts that arose from differences in pedagogic orientations expressed in school design from those adhered to by most teachers. More recently Leiringer & Cardellino,(2011) have argued how important it is to find a balance between good design, commercial realities and educational approaches. This points to the need to understand the ways in which the philosophies and discourses of design and educational practice intersect at particular moments and over time. Burke and Grosvenor (2008) examined the history of the relationship between school design and educational philosophy/practice while Cooper (1985) has argued that school building may be regarded as the physical embodiment of the educational system and the changing philosophies, which inspire it. Prosser (2007) directed attention to the ways in which teachers' and pupils' everyday behaviours shape and in turn are shaped by school culture which is manifested in part visually in the built environment. Cooper (1985) also noted the importance of non-teaching spaces, which are taken-for-granted yet deeply embedded in the teaching and learning behaviours of generations of teachers and pupils. Prosser argues that the design of schools reflect both developments in educational philosophy, as aims are re-defined, and new physical standards and methods of construction (p. 254).

Research on the participation of school users has focused on commissioning and design. Woolner et al. (2005) caution that the history of school building programmes is littered with supposedly innovative design which subsequently becomes unfit for future purpose. They stress the importance of user engagement in defining and solving design problems, so that successful solutions come to be seen as flexible and

adaptable to new learners and teachers, curriculum demands and challenges (Woolner et al. 2007: 64). This emphasis on user engagement in design processes is taken up by Clark (2010) who refined the 'Mosaic' approach (Clark and Moss 2005) as a method for listening to, and collecting data from children.

Design Matters?

This chapter is drawn from an in-depth study of ten new secondary schools built between 2003 and 2012. The overall project involves the development of a methodology for systematically analysing the relationship of school space to the experiences of students, teachers and parents. It expands notions of POE research by exploring how the intentions of an educational vision which informed an initial school design, the intentions of the final building, and the intentions of those people who occupy that building interact in a way which influences experiences of the end users. Our work is based on the assumption that these intentions will be influenced by wider social and cultural histories.

The preliminary findings reveal a significant relationship between the characteristics of the design process and everyday practices of the schools. They also are indicative of the way the outcomes of that relationship affect the perceptions of the students, teachers and the wider community.

Firstly we will report on some of the issues that have been raised in our examination of the design, build and occupation process and secondly, on selected features of the consequences for students and their teachers.

Here we draw on previous experience of studying multiagency working, albeit in the very different work places of child protection within and across child welfare services (Edwards et al 2009). In these projects we identified post-Vygotskian Activity Theory as a particularly powerful tool for conceptualising and interrogating the sometimes fluid and rapidly shifting landscapes of these forms of developing professional work and the engagement with clients. At a very general level of description, activity theorists' concern is with the psychological impacts of activity and the social conditions and systems which are produced in and through such activity.

An Activity Theory framework permits an analysis of the different motives evident in the practices of design, build and occupation; how they have emerged and are negotiated within and between the activities that arise in each form of professional practice (e.g. architecture, engineering etc.); and which meaning systems prevail in shaping them.

One approach to theorising these matters has been developed by Engeström *et al.* (1999) who introduced the concept of knotworking to describe the "construction of constantly changing combinations of people and artefacts over lengthy trajectories of time and widely distributed in space" (p. 345). The term 'co-configuration' has been deployed to describe the relationships between professional agencies and clients. "With the organisation of work under co-configuration, the customer becomes, in a sense, a real partner with the producer." (Victor and Boynton, 1998, p. 199) Co-configuration typically also includes interdependency between multiple producers in a strategic alliance or other pattern of partnership which collaboratively creates and maintains a complex package which integrates products and services and has a long life cycle. These already complex processes are rendered more challenging when there are several changes in client, multiple clients, or even confusion about the identity and nature of the client.

In our research into the complex processes of school design, we drew on the concepts of knotworking and co-configuration as points of departure in our analysis which sought to articulate different forms and

typologies of collaborative effort. We found these ideas helpful in our attempts to describe and analyse the emergence of different forms of collaboration as design and construction initiatives progressed over time. We were particularly interested in the emergence of barriers and supports to progress in developing collaborative practice over time.

Methodology

Our research was based on a 5-step, mixed methods design (Greene 2008), collecting data through interview, surveys, observation and documentary analysis, capturing both first-person (subjective) and third-person (objective / intersubjective) perspectives over the phases of the project. The sample of schools consisted of 18 examples of different secondary designs including 7 examples of 'traditional' schools used as comparators in our data analysis. Here we report findings from phase one of the *Design Matters?* project. The research team collected documentary evidence from school commissioners, architects and engineers to inform the understanding of the design brief and the commissioning and design processes. Data was also collected to understand students' experiences of their new schools prior and upon entry and how students and teachers utilise the designs in their everyday practices.

Design, build and occupation: A case study

In this chapter, we report the findings of an in-depth examination of the vision, design, build and occupation of three schools in one locality commissioned by the same Local Authority in wave 3 of the BSF Programme. In parallel, we studied one comparator school which engaged in the vision and design process in wave 4 of the County BSF programme but the programme was cancelled before the construction was initiated. We examined the processes of occupation which in three cases involved changes of leadership (headteacher). We identified significant discontinuities at particular phases in relation to either the intended physical structure and what was actually built, and/or in relation to how space was intended to be used and how it was actually used in practice. What became very clear was that different motives were in play for different agencies at different moments in the process. For example, some agencies were driven by motives related to successful bidding for contracts at one moment and motives related to costs and completion on time at another. Many of these were in conflict with one another at critical times in the process which would lead to significant compromises for the built school environment.

Following a successful application to the Government's Department for Education and Skills in 2004, the county in which this case study is based was selected to procure sample schools to participate in Wave 3 of the BSF Programme. The three schools were developed as exemplar designs tailored to meet local needs and aspirations (DfES 2004).

Two years earlier, the County Council initiated a review of secondary provision and, in partnership with the schools, developed a strategy to reshape the County's educational landscape influenced by BSF's 'Transformation' Agenda (DfES, 2003). In a bid to develop the Council's Secondary Strategy, and ensure that transformation occurred, they recruited a Secondary Transformation Team (STT) of ex-heads and educationalists. The National Audit Office's review of the BSF programme in 2009 commended this county's innovative and cohesive educational strategy prior to entry into the BSF programme.

From the onset, there was a clear policy priority to use BSF to deliver educational transformation but there was no evidence of a 'coherent definition' of this central objective. (James, 2011, p.12). Nationally, the lack of guidance led to variations in the programme, process, design and outcome as each of the bodies involved had to implement their own interpretation of 'educational transformation'. (NAO, 2009, p.6; James, 2011, p.13).

The STT set out to get the County's schools to work collaboratively towards improving standards. This work involved the development for the Schools Improvement Partner Programme for the Council (2006). 'We had to understand what transformation meant to us?' (STT interview). This process led to the articulation of a local educational vision.

The Educational Vision

The STT recognised they needed to address priorities in the local contexts. They involved head teachers from schools involved in the County's BSF programme to develop their own educational vision for their new schools. Numerous workshops were held with different stakeholders, the STT and the Council.

Four areas were identified as core elements for The County's BSF Programme (County Council, 2005)

1. Transforming the organisation of learning in schools:
2. Developing capacity and structures by extending collaborative partnerships between schools by developing clusters and transforming them into Education Improvement Partnerships'
3. Placing schools firmly at the heart of their local community
4. Designing and developing the learning infrastructure in collaboration with the sample schools.

The Council published their *Template for Schools of the Future* document in 2005 which established key strategic approaches on innovation, flexible approaches to learning, personalization and community participation.

The Council's Template also developed an educational model for students to be taught in 'learning clusters'. The cluster concept was based on the principle of 'schools within a school'. The structure offers small-scale educational nuclei which support a strong pastoral-care system and allow each school to choose its own grouping of specialist areas depending upon needs (CC BSF Template; 2005). The strategy was for students to be taught in a range of different size learning groups (from small group work up to groups of 240) to support the move towards autonomous learning. The Council's rationale for change was grounded in an intention to replace traditional teaching methods which focused on a 'chalk and talk' model of education in which students were passive recipients of this knowledge to one in which students became actively engaged with the learning experience through inquiry-based learning. The Council's strategy for transformation was to provide the vision for new ways of delivering secondary education in the County. It followed the core elements of the BSF programme which promoted personalised learning in curriculum content, assessment, learning style and different forms of learning. Models were developed for a diverse range of open-plan learning spaces, which illustrated features of adaptable environments, addressing acoustic and ICT needs for

learning in a variety of group sizes, from individual learning to large group sessions (see fig. 1). These design templates would serve as models for how personalised learning could be delivered in the Council's new BSF schools.

The Council recognised that this process of transformation would take time and argued that this would require visionary professionals working in buildings with innovatory features.

Vision for Learning Spaces

fig 1.13

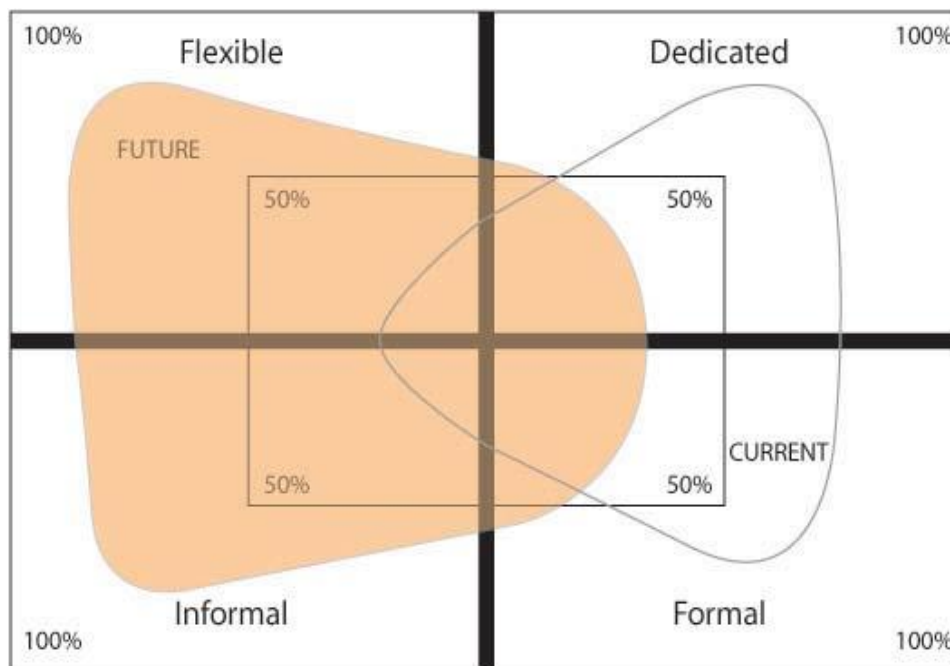


Figure 1. xxx

It was apparent that the STT and Council was strongly committed to this new educational vision and sought to ensure that it was championed by each school and their design teams. Each School, led by the head teacher, worked with the Sample Schools design team and the Council to develop their own learning clusters of specialist areas within the Council's concept set out in their Template. They argued for designs that could not be occupied with traditional forms of practice.

'These buildings have been designed in a way that makes it almost impossible for them to go back to square one. That was our guiding principle.'

A key part of the visioning process at the Council was a trip to the United States in 2005, which involved 93 secondary school heads on a fact-finding trip to survey selected American charter schools to gather data on programmes, pedagogical initiatives and exchange ideas with innovative US educators. The stated purpose was to help the headteachers develop a new vision for schooling.

Whilst this strategy of looking further afield accorded with BSF guidelines, it did not fully recognise that evidence that something "works" in one context does not necessarily mean the same intervention or action will be relevant in another context (Cartwright and Hardie, 2012). Interestingly, we have similar

situations in other schools in our project; many had gone beyond their local context when developing their visioning process and implemented new ideas with little evidence that these novel approaches would work in their local educational context.

In March 2006 the Council, in collaboration with the school communities, began work on the BSF Sample Schools project to help develop each school's Educational Vision for the outline business case. The Council commissioned a Project Management Company who in turn commissioned a firm of leading architects in the field of educational buildings to design the three sample schools. The sample schools project aimed to translate the Council's vision of 'autonomous and creative learners' (CC BSF Template; 2005) into 3 preliminary school designs. These were conceived to serve as design briefs for the procurement process and act as a springboard for the bidding teams.

The Sample Schools architects were commissioned to translate the Council's BSF educational vision into preliminary designs within an 8-week time frame. They had 5 workshops with each of the sample schools. These workshops were aimed at developing each individual school's pedagogical vision and translating these ideas into a new 'accommodation schedule' within the BB98 funding envelope. We will refer to the schools as A, B and C.

Our interviewees all expressed positive feedback on the level of engagement and active collaboration at this early stage of the process. A close working relationship was forged between the Council, the schools and the architects. There was extensive consultation and creative engagement with the community. The architects, the schools and the Council mobilized a unified, collaborative approach towards early conceptual designs which they agreed met the requirements of their educational vision.

The Council was one of the early adopters of the BSF competitive dialogue process. The purpose of the process was to find a consortium to fund, construct, and maintain the schools.

During the competitive dialogue process, the Council selected two bidders to design the schools from 12 initial bidders, before selecting its preferred bidder to develop the detailed designs before financial close. The bidders reported that the onerous process placed 'unsustainable strain' on their bidding capacity (NAO, 2009:47).

The Council and the schools had to invest intensive periods of time in the competitive dialogue process but the participants we interviewed felt they were being asked the same questions they answered in earlier phases of the project.

'We were asked the same questions again, it was as if we were back at square one after months of work. At that stage, we felt we had done the work. We had a design that everyone can work with but we had to start all over again with another design team' (Headteacher, School B)

'It was frustrating, I felt like some of the conversations we had with design teams along the way hadn't been documented properly so when we went back and said we had agreed on a particular decision there was no evidence that that conversation had taken place.'
(Headteacher, School C)

The outcome of the process was also ‘disappointing’ for some of the schools, as the consortium that produced their preferred designs did not win the bid. (The selection process for BSF PFI projects weighs design, financial, legal and facilities management [FM] issues and therefore it is not always possible to select the bidder with the preferred designs.)

The delivery architects for the preferred bidder informed us of their ‘frustrating’ experience of discontinuities in the design process at this stage. This was as a result of conflicts between their professional role to understand and design for the needs of the end-users and the formal routes of communication during the competitive bidding process.

The delivery architects designed innovative open-plan spaces that aimed to facilitate different styles of learning in line with the educational vision. However, the usability of the built open-plan spaces were severely undermined by pressures on the contractor to meet budgetary requirements during construction once financial close was completed.

The decisions made in this phase were critical to whether the initial educational vision of the school could be delivered. Different team members felt frustrated by the conflicts between their contractual obligations to their client (the contractor) and their professional obligations to the end users (the school). The delivery architects stressed that there was a notable absence in the form of a quality and design compliance monitor working for the Council and the schools during this phase of the project. Someone acting in this role could have ensured the built design would provide educational spaces that could deliver the educational vision set out at the inception of the Project. In the schools we studied the match of the educational vision and resulting building was highest when an end user representative who would occupy the building had taken on this role.

Findings

School A

In School A, there was a very high degree of involvement by the current head teacher in all the design and construction phases. When asked in interview whether there was anything she would change about the design of the building as occupied she answered ‘nothing’. She acted as the active facilitator of collaboration throughout the project

*‘My vision was to create a 21st century learning environment where students can flourish, can work independently to build up their social skills as well as develop their intellect.’
(Headteacher A interview)*

The headteacher took on the role of quality and design compliance monitor in the process and ensured that the contractors delivered a building that met the requirements of the intended educational vision. For co-configuration to actually take place there was a need for client continuity, in some form or another, throughout the process.

The design offers large open spaces with a mixed economy of smaller cellular rooms and breakout zones. Figure 2 shows the typical floor plan of the open plan teaching zones. The process of occupation was

considered instrumental to pedagogic transformation. A ‘mock up’ of the open learning zone and breakout spaces was constructed in the gymnasium of the old school building.

‘We mocked up open plan learning spaces and learnt how to use them effectively to improve progress for our students. We were preparing a good two years before we moved to learn how to teach in a new way.’ (Headteacher A interview)



Figure 2. School A Concept Sketch.

This was used as a test bed for the development of new approaches to teaching and learning. This process of learning to use new configurations of space continued once the building had been occupied. The headteacher argued the case for conscious leadership of her staff in learning how to use the space and develop pedagogic practice which transcends what were seen as the inevitable pitfalls of trying to teach a single class in a single room. The headteacher also resisted attempts to reintroduce informal delineation of the large open zones.

'We dedicate one night a week to planning and that planning time is purely open plan learning support therefore if you're teaching with two other members of staff it's not about what you're going to teach it's about how you're going to teach it in a class of 60 kids or with 3 groups of 90 or 100 kids.' (Headteacher A interview)

It was not only staff who had to learn to use the new building design. There was an explicit approach to 'teaching' the new rules of social order in the new spaces of the building.

'We encourage youngsters to regulate themselves to some extent but there are expectations, there are zone protocols, what they can and can't do in the zones, there are expectations about the best way to learn, you are here to progress, you are here to become better learners. .. a lot of emphasis upon independence.' (Headteacher A interview)

The timetable and management of the school were designed to promote the best use of the new spaces. The headteacher appears to have a relatively informal charismatic and personalised approach with staff and pupils. The staff reported they felt supported by team / carousel teaching and nearly all of the 36 students interviewed reported that they enjoyed active learning and working in groups in the open learning zones. The school reported that parents were initially cautious but with higher attainment and encouragement by the headteacher to spend time observing the new ways of teaching and learning at school A, the school is now oversubscribed.

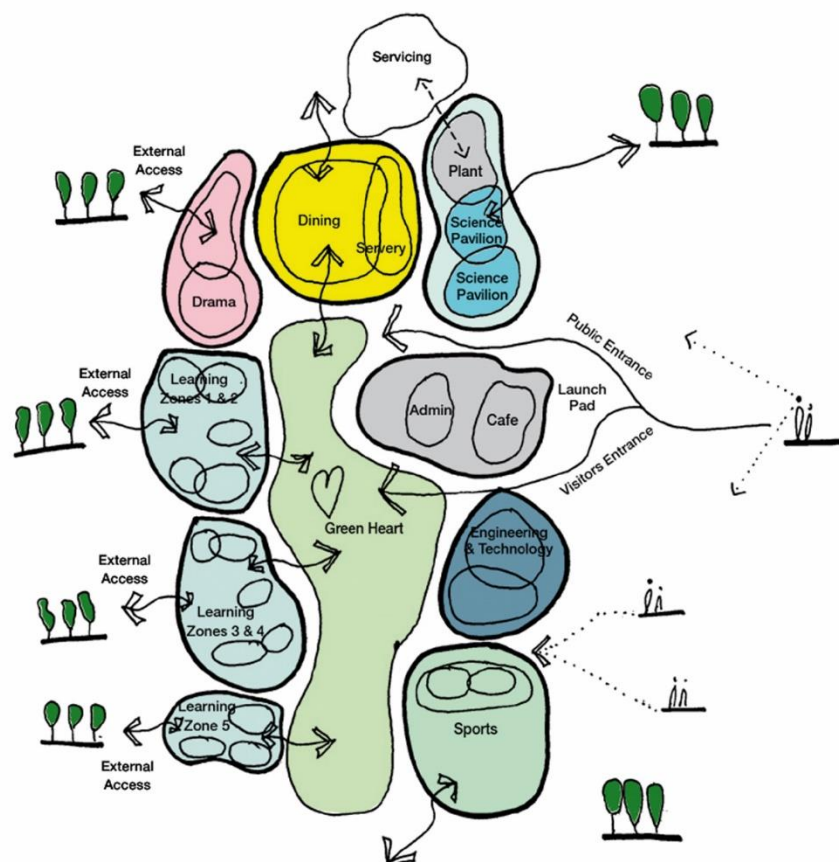


Figure 3. School A Learning Zone Concept

The students responded enthusiastically to the demands of the new forms of pedagogic competence.

'In our old building, we had cramped classrooms and dark long corridors. It felt gloomy and depressing. When we came to this school, it just felt modern. There are five big zones where each space can fit four classes. We have open learning and everything changed.' (L6th student interview)

They also identified specific benefits in terms of use of space:

'I feel like I can learn better in a zone than in a classroom. In a zone, you have more space and you can sit with people you work well with. You can move around and get help from each other and different teachers.' (Y7 student interview)

The headteacher could also point to objective measures of improved performance both in terms of use of space and academic outcomes:

'Design does matter, the conversations, the way the zones are set up, the way students engage with each other. Since we have had this new building, results have improved enormously. We have more students stay on, we have more students go to University. This building makes them feel wanted and gives them an aspiration.' (Headteacher interview)

This was the only school, which witnessed an explicit and overt attempt to learn how to use the spaces of the design as envisioned. The design, construction and occupation processes were characterised by high levels of collaboration and active participation in which flexible groupings of different professionals experimented and prototyped the emergent final design of the building. The design and the new form of practice, which emerged was an outcome of this ongoing pattern of mutual shaping over time.

This was a form of mutual shaping of the emergent design in which no single actor or agency led the process. In a similar way the occupiers of the building worked together, knotworked, to explore the potential of the design that would afford the forms of pedagogy that they continue to develop.

School B

This school design project involved a high degree of involvement on the part of the original head teacher (B) in the design and construction phases. The design was based on the 'schools within a school' model. It is the most radical design of the schools in this study. On initial occupation the building had four clusters of 12 open learning zones opening onto double height atrium spaces on the ground floor. Central to the design was an expansive, open 'heart' space that connects all the mini school clusters (fig. 4). This very dramatic and aesthetically pleasing space is used for dining and whole school assemblies.



Figure 4. Heart space concept.

The design assumed integration of curriculum areas. The vision was that of thematic curriculum content taught by teams of teachers who did not 'belong' to departments as much as they did to their 'mini-school team'.

The current temporary head teacher (B2) is developing a much more formal approach to teaching, subject knowledge, departmental structure and discipline. His claim that students, teachers and parents hated the open spaces was used to justify a retrofit. The case was made to the Governing Body to borrow a large amount of money (£850,000 plus) from the Local Authority to build glass walls on the front of the open classrooms and to introduce partitions into the open areas within the mini-schools in order to reinstate cellular closed classrooms. The new retrofit is reported by the Head to be much more popular with students, teachers and parents. In some cases these were the same families where siblings attended school A and reported high levels of satisfaction with learning in large open zones.



Figure 5. School B Learning Zone Concept

Members of staff felt that the open design had interrupted their established form of practice. The design presented them with challenges that they were ill prepared for.

'I had been in the old school for eight years and had to leave after 9mths in the new building. It was a disaster, I totally disagreed with the way we were being asked to teach in the open plan learning zones. The noise was horrendous and the students could not concentrate. I came straight back after the new head came in and new walls were built, the school works much better and the students are happier.' (Teacher interview)

Students reported acoustic challenges to their studies in the original design

“When we were in our lessons, like, where there were other classes next to us and there weren’t no walls there was a lot of noise going around so it was hard to concentrate and everything’ (Y8 student interview)

The adaptation was not anticipated in the imagined practice and the architects were not involved in the retrofit exercise. The poor environmental conditions (acoustics, ventilation and temperature) created by the retrofit have brought new challenges to teachers and students.

Students reported that they had felt claustrophobic due to a ‘lack of air’ and they also described a desire for spaces that are less cramped:

“I hate the closed classrooms, they are so hot, I feel like I can’t breathe sometimes. I wish you could spread yourself out and everything rather than being in a cramped space” (Y8 student interview)

“It’s better like in more of an open space like the heart space because there’s much more room to work in. The glass walls make the classrooms a lot more cramped when we’re all together, it’s really hot and hard to concentrate.” (Y8 student interview)

The lack of preparation for participation in new forms of practice envisaged in the design resulted in the design being understood as an unwelcome imposition that was resisted or dismissed.

On first occupation in school B there was an attempt to align the object motives of the design and the practice. There was evidence of partial co-configuration through collaboration in the design and construction process in the absence of the teaching staff but there was no evidence of the development of new discourses and practices of teaching and learning as afforded by the design and were implicit in the original vision and design brief for the building. The affiliation to the radical design stemmed largely from headteacher B1 who had not engaged his staff in his vision for the new school. Knotworking was not apparent. In part the resistance of the staff and perhaps the very radical nature of the design rendered this engagement problematic. The second occupation did not share the pedagogic orientation of the vision and this led to a new retrofit which presents significant consequences for the environmental conditions of the school.

School C

In this case, there was little involvement of the original head teacher C1 in the design and construction phases. A deputy headteacher represented the school’s views.

We were informed of strong management of the construction phase by the contractor. It was suggested that the constructor kept parties apart and produced a palpable sense of disconnection between educators and other stakeholders. Here there was a deliberate and explicit attempt to prevent active forms of collaboration, which from the perspective of the contractor would have inhibited progress towards their desired outcomes.

‘I joined the project after we had won the bid, and to me the whole process of developing the design with the school after that seemed wrong. I expected open, informed and dynamic

discussions, held within openly stated constraints of affordability. Instead we got only very limited contact with the school, carefully choreographed by the main contractor so that we didn't say a word out of place. The school probably felt they should have had a lot more say in the development of the design than they ended up having.' (Delivery architect C)



Figure 6. School C Learning Zone Sectional Perspective

We have gathered accounts of communication being managed between stakeholders with elements of messages being redacted. We also have obtained accounts of the preparation of bids for a contract involving the deliberate obfuscation of limitations in the design with regard to acoustic performance. The design specification including large open spaces on single floors were designed for 3 groups of pupils of the same age studying the same subject at the same time. The vision was that of 3 teachers plus classroom assistants working with 90 pupils in the open learning area and making flexible use of breakout spaces.

'Not enough detail was included in the design at both bid submission stage and financial close stage. This meant that the client was very exposed to substandard quality creeping into the design as we detailed it. The main contractor was unwilling to share with us the cost plan during detailed design development, nor use our design expertise in cost-cutting discussions. In the end, they had ignored many of our drawings and specifications and built the way they wanted to, to the detriment of quality and performance.' (Delivery architect C)

During the design and planning stage significant concerns were reported. The acoustic engineers raised questions about whether the design of the open-plan learning zones would function effectively. Engineers reported concerns to contractors who were driven by motives concerning securing the contract.

When the contract was won motives concerning completion and cost deflected attention away from the original acoustic concerns in the value engineering process.

The current head teacher C has a strong focus on attainment and has been successful in improving standards. However the school is not managed in a way that aligns with the original educational vision. The timetable does not place same-year groups or subjects in the open areas. The occupation of the building is characterized by informal attempts to change the organisation of space, through placing furniture in such a way as to try and recreate the sense of single classroom spaces. This results in physically awkward spaces which are generally regarded by staff and students as not fit for the purpose for which they are now used.

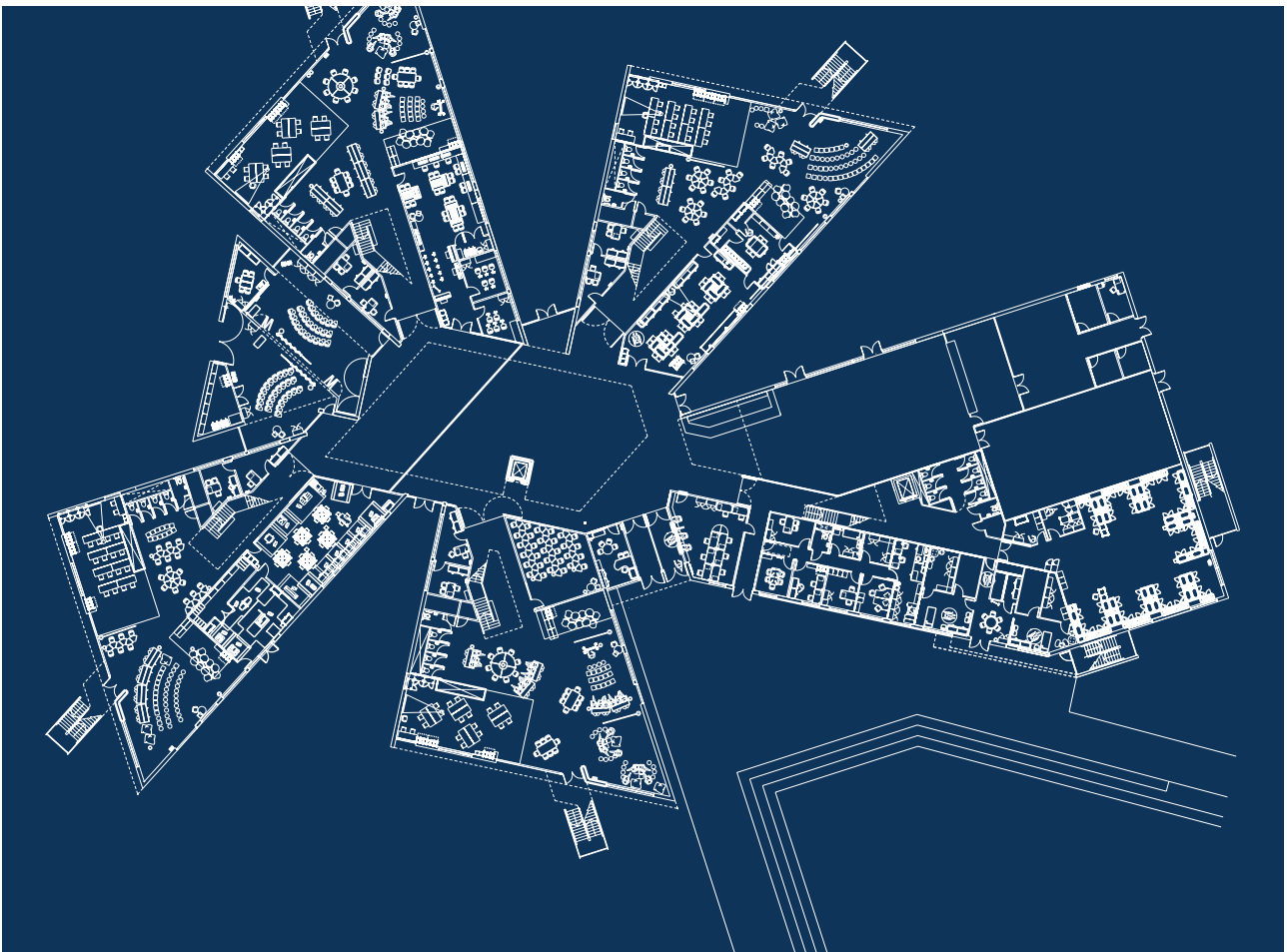


Figure 7. School C Learning Zone Concept

Students and teachers are very concerned by the significant environmental challenges. Design and practice are in direct conflict. Teachers have commented that using these informally adapted open classrooms disrupts and add tensions to their daily teaching practice.

'I teach with my back to the other open classroom, I absorb anything that is going on there noise-wise. I absorb it, and because it's hitting me first before it's hitting the students in my

area, it throws me when the other class is being disruptive and we can hear everything.’ (Y7 English teacher interview)

Another Y8 teacher uses a double space as her classroom. The open learning zones were designed to have two or three classes together but now it is just used for one class at a time.

‘It only works when I don’t have another class teaching in the other open space...having no doors and walls is a real problem’ (Y8 Maths teacher interview)

‘No walls and doors mean that when children from other classes come to get laptops there’s a lot of distraction from them...particularly if I’ve got another class in the zone. There’s four lots of distraction potentially. If students are sent out of neighbouring classrooms and teachers are talking to them then there’s not a lot of privacy because my children can hear and see what’s going on.’ (Y8 English teacher interview)

Students also feel that the noise within these areas disrupts their learning:

‘I don’t really like the open plan because you can hear all this noise and it distracts you all the time.’ (Y7 student interview)

In the absence of the substantial funding that would have been required to remodel the design, informal approaches to reconfiguring the spaces were invoked. These amplified the disaffection with the original design on the part of staff by virtue of difficulties with acoustics and the intention of the original designers to not allow returns to previous practice. There was no attempt to learn how to use the spaces as envisioned.

In school C there was limited co-configuration in the original design and the first occupation was brief. The second occupation was based on a pedagogic vision, which was in stark contradiction to the original design.

Conclusions

Thus far we have reported some of the findings which reveal some of the ways in which school buildings play a role in mediating the pedagogic process. We have argued that it is important for design to recognise and respond to local contexts. However, we have also shown how processes of management and leadership impact on processes of occupation and, in turn, how these impacts shape the design and patterns of use.

Our findings reveal that contradictions embedded in the building from its design process shape the possibilities for pedagogic practice which in turn may also seek to re-shape the building itself. It is the tensions that are set up between these strands of development which have given us insight into the dynamic way in which mediational processes progress after occupation.

Our data has shown that some buildings may be so riven with contradictions that adaptations to particular preferences may prove ineffective and the building becomes perceived as dysfunctional. This may either be because of features internal to the design or because of relations between practices of construction

and funding. We also have evidence of adaptations which were successful in re-shaping these school buildings in a way that rendered them more fit for the purposes of the occupiers.

Design and practice

The relation between design and practice is crucial to the production of a building which can be and is used effectively. The suitability of the building for schools' pedagogic practices as they change through time will be determined by the building's potential to adapt to the school's changing spatial needs and the school's understanding of the building's design principles. There are three elements to this relationship.

Firstly, it is more likely that a successful occupation and use of a building results when the practices that the occupying staff wish to follow mirror the principles of practice that are embedded in the vision and design. Secondly, this is most evident when the eventual practitioners (usually the Headteacher who takes over the school building on completion) have been involved in an inclusive consultation process throughout the vision, design and construction process. Thirdly, it is quite clear that the principles of the design brief may be regarded differently by different individuals and professional groups. This may seek to compound problems with the relationship between design and practice.

These conclusions lead us to form a general argument that one design may be perceived and used in very different ways in different practices of schooling. We also argue that good design requires good multi-professional holistic post occupancy evaluation which has a remit that goes far beyond the physical functioning of the building. An understanding of social relations that are enacted within a design as it is taken up by different forms of practice is crucial to the development of better sites for schooling.

In short, we suggest that social practices of negotiation and collaboration are vital elements of the processes through which a school is designed, built and occupied. This requires clarity and continuity in the operational definition of the client. In interview a senior architect suggested that the key role of the architect was as 'orchestrator' and a contractor suggested that 'integrity must lie at the heart of a build'. In their different ways they appear to recognise the need for the formation of common objects of the work.

Importantly we have shown how one design can be used in different ways. Rather than design determining behaviour it takes up a dynamic and fluctuating relation with the practices of occupiers resulting in a wide variety of outcomes. Different approaches to school leadership and management give rise to distinctive school cultures which in turn make differences in the use and adaption of a school building. We take the findings as a strong argument for the development of a social and cultural dimension to post occupancy evaluation which examines human practices in buildings over time and through different management cultures. It is as if there is a process of resignification at each point of cultural change in successive management regimes. As the headteacher of a successful new build free school noted: *'The design is a provocation to learn differently but it's what you do inside it that matters.'*

Taken together these findings point to the need for post occupancy evaluation that includes human action and perception over time and the inter-connection between design and practice and how this may change over different occupations (school leaders). The findings also point to the need to redefine 'sustainability' in terms of adaptation to different forms of practice. In order to extend the functional life of new school buildings the vision and design process must allow for adaptation as educational policies and practices change through time.

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