Designing for transformation – a case study of open learning spaces and educational change

The design of a school building can be understood to play a central role in the creation of learning environments, and can therefore support educational change. However, non-architectural elements also need to be considered which can determine the success of a learning environment, particularly when change is attempted. Material space, pedagogical and organisational practices, staff culture and student milieu are interconnected features influencing a school as a whole learning environment. We draw from a theoretical framework (Gislason, 2010) to study the dynamic between learning spaces and teaching and learning in a single case study of a primary school in the UK that was designed to enable educational transformation. The school was intended to support flexibility of use of the learning spaces to enable different teaching and learning approaches. In this article, we highlight that the initial school educational intentions are still relatively in place, and the building is generally used successfully. In doing so, we argue for the importance of reaching a balance between the design of learning environments and the educational agenda. It is the necessity of achieving this alignment that makes school space a powerful local driver of educational change, while simultaneously suggesting the inherent difficulties in attempts to use physical alterations to spearhead policy-led transformation.

Keywords: open-plan schools; participatory design; educational change; learning environments.

Open-plan spaces and educational change

Recent international interest in the ‘transformation’ of learning, particularly through educational technology and ‘innovative learning environments’ (OECD, 2013; 2017; Bradbeer et al., 2017; Mulcahy & Morrison, 2017; Alterator & Deed, 2018) has reignited debate about school design. However, transformation and innovation in school design has a century-long history. In the early 1920s, examples of radical school designs in US and across Europe were indicative of a move away from traditional, teacher-centred teaching towards progressive, pupil-centred, constructivist learning, entering the
mainstream curriculum. Initially relating to hygiene and health issues, radical design ideas, for example the open-air schools and the works of Montessori and Steiner on active learning, have influenced school building design (Dudek, 2000). The radical educational ideas of John Dewey influenced Frank Lloyd Wright’s school designs, which later became paradigms in the history of school architecture.

During the second half of the twentieth century, open-plan schools widely spread in the US, UK and Canada derived from a renewed interest in student-centred learning, mainly in preschool and primary education (Gislason, 2015). In England, architects Mary and David Medd, initially working for Hertfordshire County Council and then for the Ministry of Education, pioneered the rejection of the concept of enclosed classroom in favour of semi-opened interconnected spaces of differing character (Franklin, 2015). The Medds believed in the importance of designing schools from the inside out, using as the starting point the observable educational needs of the pupils and the teachers (Burke & Gosvenor, 2008). Of particular note was Mary Medd’s Finmere School in Oxfordshire. The school was designed based on a pupil-centred approach to learning and with close collaboration between the designer and the educational authority. Used as an exemplar in the Plowden Report (Central Advisory Council for Education, 1967: 395), Finmere ultimately set the trend of primary school design for the 1960s (Dudek, 2000).

The popularity of open-plan schools rapidly declined in the 1980s. The drastic drop of the open-plan concept was understood as being due to teachers’ lack of training, during initial teacher education, and a lack of ongoing support to develop practice on the use of its layout (Brogden, 2007). They were not able to cope with the provision of the multiple arrays of possibilities leading them to revert back to the tried and tested approach to teaching and learning, even if this did not work well in open plan spaces.
(Bennett et al., 1980; Higgins et al., 2005; Author, 2011). Many of the schools originally designed as open or semi-open plan were converted to traditional classroom based layouts in the following decades (Franklin, 2015).

Despite these challenges, the beginning of the 21st century is characterised by the resurgence of non-traditional open-plan schools. A wave of educational policies in different parts of the world propose a need to transform the way education is conducted and argue for innovative learning spaces designed to support ‘21st century learning’, for example the Building Schools for the Future programme in England and Wales (4ps and Partnerships for Schools, 2007), the Building the Education Revolution government programme in Australia (ANAO, 2010) and the Innovative Learning Environments project (ILEs) in Canada, Peru and New Zealand (OECD, 2017). These new open-plan school designs are driven by intended changes in pedagogy together with twenty-first century ideas of ‘mobile’, ‘agile’ and ‘flexible’ learning environments (Dovey & Fisher, 2014). These spaces can present opportunities and constraints. The openness of the space can facilitate learning practices that involve large groups and team teaching drawing on elements of flexible-use architecture, like sliding partitions and specialised work areas (Woodman, 2016). Indeed, Gislason’s (2010) study of open-plan schools highlighted some pupils’ preference for the open-plan setting over the enclosed classroom; they explained that the open space provided: better social connection with other pupils, a feeling of being more socially accepted and enjoyment of being at school.

These spaces can also be challenging for students and teachers, as they adjust to new conditions in which to learn and work, through for example noise, visual distraction and collaborative approaches to teaching which, as noted above, are not straightforward to adopt (Mulcahy & Morrison, 2017). Open-plan designs can be
considered to be more suited to pupils that are better at self-regulating than for those who become easily distracted, since an open space has less barriers to visual, noise and social distractions (Ahrentzen & Evans, 1984). Already there are indications in the UK that the open-plan designs of BSF are being retrofitted with walls (Jędrosz, 2016; Daniels et al., 2017). Though, in Gislason’s study of the School of Environmental Studies in the US, pupils did not allow noise or traffic to become a negative aspect. He suggests that contributing factors might be that they are academically motivated, are older pupils (between 15 and 18 years old) and so want to maintain order in the learning environment. He also notes that the school is situated in a relatively affluent area and the pupils tend to come from families with higher levels of education. Therefore, it is important to look at how learning spaces and pedagogical approaches are related in practice.

Notably, for staff open-plan space does not support innovation by individual teachers, which in a traditionally individualised profession will be problematic (Hargreaves, 1994). The inevitable need for cooperation, if not actual team work, requires concerted change beyond the individual (Wood, 2017). Even when a whole school or functional groups of teachers are committed to such change, the development of team teaching is challenging and very time consuming (Campbell et al., 2013; York-Barr et al., 2007). Furthermore, in many countries, the last decade has brought technological innovations that have acted to cement the tendency to return to traditional teaching with electronic whiteboards providing a fixed teacher controlled focal point and making rows of desks in an enclosed room seem logical (Tondeur et al., 2017).

The relationship between the educational experience and the architectural context is still in danger of being either overlooked or simplistically misunderstood. Indeed, it is still not so clear how forms of open school environments are matched to
new emerging pedagogies (Dovey & Fisher, 2014). It is important to highlight that the architects’ intention can only be fully realised if school users – with an emphasis on teachers – are able to fully understand and support the pedagogical approach that informed the design of these spaces (Burke, 2017).

In this article, we present a single case study of a primary school in Northern England, with an innovative open-plan design and we draw from a conceptual framework (Gislason, 2009, 2010) that links material, organisational, cultural and social elements. We argue that the school building on its own cannot support educational changes but that the particular educational practices of this school are largely achieved through an alignment of the building design with pupil dynamics, staff culture and school organisation. Attention was paid to these non-architectural elements at the design stage, through an individualised design process, and continues, as we will show, in the school’s daily practice.

**Aligning factors of the learning environment**

This study is based on the notion of space as socially produced (Lefebvre, 1991) and on the recognition of a productive relationship between space and social relations (Benade, 2017). The spatiality theorising of educational settings has shown how physical aspects of space mediate social relations (McGregor, 2004; Morgan, 2000). If space is acknowledged as socially constructed, then school settings cannot be regarded as an objective collection of physical entities, but as active organisational agents, embedded within complex webs that include the beliefs, actions and practices of staff and pupils (Gislason, 2010; Mulcahy et al., 2015; Rivlin & Weinstein, 1984). In conceptualising learning environments, scholars in education are increasingly drawing on the ideas of ‘entanglements’ of ‘objects, spaces, policy discourse, practices, students and teachers’ (Chareris et al., 2017: 809; see also Carvalhoa & Yeoman, 2018). However, we would
argue that while such social-material theories are vital in highlighting the nature of learning environments in general, they are less useful as a means to analyse or evaluate a particular school setting.

Gislason draws from research on climate and organisation in schools to produce a conceptual framework that is specific to schools and can be used to analyse a setting (2009, 2010, 2015). In recognising that a school’s physical design is only one of the sets of interacting elements that comprise the learning environment, Gislason’s framework enables understanding to be developed about how educational spaces, teaching and learning relate in practice to produce a learning environment case that is functioning (or presenting challenges).

The model considers four interconnected factors within the school environment (fig. 1): organisation, including scheduling and curriculum; staff culture, understood as the underlying teaching values and beliefs of teachers and staff; student milieu, the learning, motivation and social climate of students; and, ecology, considered as the building design, technology and other material elements.

As complementary aspects of the learning environment, Gislason highlights the need for these four elements to be aligned with one another. This alignment is even more important when innovative approaches are being implemented since they involve unfamiliar practices and teaching. The dynamic interdependent relationships that comprise the learning environment suggest the importance of architects considering educational intentions and educators understanding how to use the designed space (Parnell et al., 2008; Author, 2010; Author, 2015). User participation in the school
design process is advocated as a means to achieve this alignment and understanding (Author, 2015). Bruce Jilk's 'Design Down' process involves school staff and architects concurrently planning a school's organisation, pedagogy and space and was successfully used to design an innovative school in Iceland that continued to be used as intended (Sigurðardóttir & Hjartarson, 2016). However, at the policy level participatory design is not always valued or prioritised - for example the 'James Review' in England (2011) explicitly argued against attempts to involve the users of the building in the design process, considering it to be time-wasting, inefficient and expensive (see also, Parnell, 2015).

Methodological approach

This paper draws on a single case study approach to investigate the design and use of the learning environment in a school in Northern England. Drawing on Gislason’s framework model, the aim of the study is to investigate how the school was designed and built to achieve a learning environment that is compatible with, and aid, specific transformational educational approaches, involving different teaching and learning techniques. Particular focus was given to the relationship between the design of the school environment and the social, organisational and physical aspects that characterise its pedagogical vision.

We consider our focus school as a case and our knowledge of it was developed through several site visits. Although a ‘study visit’ to a site is common practice in architecture, researchers in education would tend not to recognise such an ‘open’ activity as a research design (Clark et al. 2017: 248). However, research in education can equally be criticised for an over-emphasis on displaced methods. As researchers from education and beyond are increasingly making clear, research methods are enacted somewhere, and this context has implications (e.g. see Anderson & Jones, 2009; Duarte
et al. 2015 for discussion of the impact on interviews and focus groups). Thus, there is a growing awareness of the places and spaces for education research, and we are aligning our approach with this development, drawing particularly on the idea of ‘place based’ research (Thomson & Hall, 2016).

In general, we understand our investigation as ‘hanging around schools with serious intent’ (Thomson & Hall, 2016: 170) with the aim of appreciating the particularities of our school in order to develop a larger educational argument. Specifically, during our visits to the school, we made use of unstructured observations, incidental interactions with staff and students and semi-formal discussions with the head teacher.

**Case study - Jesmond Gardens Primary School**

School visits were conducted in the autumn of 2014; winter of 2016 and summer of 2017 with a number of data collection techniques used. Guided tours with the head teacher provided an in-depth understanding of the school vision, organisation and design alongside opportunities to see staff and pupils using the resulting spaces. Background information was sought in the form of written documentation including policy statements and official documents such as Ofsted reports. Photographs were taken of details of design solutions enabling the particularities of the case to be addressed.

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1 In consultation with the head teacher, and for a number of reasons, we have chosen not to anonymise our case study school. Essentially, our discussion of its specific design simultaneously benefits from the school being identified while making it virtually impossible to disguise it. Such identification is normal within the discipline of architecture and has also been practiced with case studies of school design and use within the education literature.
The following sections present brief accounts of the key issues observed in the school. These consider, in turn: the school context and design process; the school design and its organisation and how users utilize the building in relation to the teaching and learning.

**School context and design process**

Jesmond Gardens Primary School (JGPS) is a community mixed-sex school in Hartlepool, located on the east coast of England, an area that has experienced deindustrialisation and significant decline over the last few decades. The school enrolls about 350 pupils between the ages of 3 to 11 years old every year, and its enrolment levels have slightly, but steadily, increased since the opening of the new school building in 2011. The school has a slightly larger number of pupils than average-sized primary schools in England. There is a well above average proportion of disadvantaged pupils attending the school, where 50% are known to be eligible for free school meals (Ofsted, 2014). The proportion of SEND (Special Educational Needs and Disability) pupils is, also, above average.

The school is located in a neighbourhood with a number of challenging demographics, which include: high levels of unemployment and poverty, significant proportions of social housing and of families with considerable challenges and problems. Reflecting this situation, the school learning outcomes six years ago were low compared to other schools in the Local Authority region. However, over the past years, learning outcomes across all indicators have improved with the school now performing very well, and the most recent Ofsted report (2014) showed overall ‘good’ school effectiveness including pupils’ ‘outstanding’ behaviour and ‘outstanding’ attitudes to learning (Ofsted, 2014).
JGPS was built under the ‘Primary Capital Programme´, an initiative intended to replace and modernise at least half of the country’s primary school buildings by 2022, concentrating on the 5% of schools in the worst conditions and those in the poorest areas of the country. The programme’s white paper document (Primary Schools for the Future, 2007) called for a ´pedagogical approach´ to school design and introduced a three-stage process to achieve this, which paralleled the approach that was already underway for secondary schools through Building Schools for the Future (BSF). Like BSF, Primary Capital Programme emphasised the importance of an early stage involvement of educators in the design process. Also like BSF, it was discontinued with the change of government in 2010. School buildings in both primary and secondary sectors are now being built under the Priority School Building Programme that is founded on standardised designs instead of the individualised designs valued by BSF and PCF (see: Author, 2017).

The new school building replaced an existing Victorian school located on a nearby site, Jesmond Road Primary School. The head teacher was appointed in September 2004 for the former school and was part of the design process to build the new facility. Her vision for the school was to make it into a ‘transformational’ one, not only in terms of innovative pedagogical ideas but also its physical environment, as she explained ‘we didn´t want a new old building´ (extracted from the head teacher’s interview). The intention with the design of the school was, according to her vision, to ‘create a welcoming, inspiring and secure environment´ for primary children making the most flexible use of all the available space.

The design of the school building was a collaborative process between the head teacher, her deputy and the architects. The head teacher highlighted her satisfaction with the process of collaboration and stated that ´…it was wonderful to work with people
who could get inside our heads and put our vision into reality’. The head teacher felt, though, that some foundational ideas were clear from the very start of the process: flexibility of use of the learning spaces and the instrumentation of the ‘super-class philosophy’ - units for 90 children from two years groups with a team of teachers. This not only meant that staffing needed careful planning, but also required innovative design elements, such as acoustic solutions and easily moveable furniture. Added to these challenges, there was a need to make it exceedingly comfortable. The head, particularly, wanted the school to feel calm and relaxing; ‘a cocoon from the outside world’.

Participatory design sessions also took place during the design process with members of staff, governors, pupils and Hartlepool Council’s design team. A number of topics were discussed during these meetings, but the main ideas built around the transformation of the educational agenda within the school building, including concepts such as ‘sense of belonging’, ‘school as a home’ and ‘enjoyment of learning’.

**Building design and school organisation**

The resulting school building is recognised in the area for its distinctive design. With three cylinders popping out from the rooftop, JGPS stands out from the surrounding streets of conventional older houses suggesting that something different is happening inside (see Figure 2 and 3).

![Insert figure 2](image1.png)

![Insert figure 3](image2.png)

The layout of the school building is composed of two distinctive areas: (1) the
instructional one with a hexagonal shape and (2) the administration, which also contains the main hall (see figure 4). There are no conventional corridors or cloakrooms in the school; instead the learning spaces are interlinked and there are pull out trolleys for coats and shoes, with toilet pods, which are self-contained units consisting of toilets and washbasins, providing privacy for pupils. The school has adopted a ‘no shoes’ policy where all the users of the building, including pupils, staff and visitors must remove outdoor shoes on entry. Teachers do not have their own ‘teacher’s desk’; instead storage is in wall cabinets and teachers were observed sitting at student tables to complete lesson preparation.

Insert figure 4

The openness of the spaces within the building is crucial to the particular school educational ethos. The open settings help foster a sense of community among pupils and staff because there are few physical barriers to social interaction. For example, the head teacher’s office is located in a strategic position that allows for the observation of the school activities from the large glass windows as well as enabling the pupils and staff to see what happens inside the office.

Internal and external spaces work to provide an integrated environment. The single storey design and the floor to ceiling glazed doors allow a direct relation between the inside and the outside, though the ‘no shoe policy’ does not necessarily encourage this link to happen smoothly, since pupils and staff have to put on their shoes to go outside.

From the outside, the main entrance is highlighted by the juxtaposition of the administration and the instructional areas and inside leads to what is known as the ‘heart’ of the school. This central area of the building provides ‘agile’ options for
assembly, lunch times, and to house the community since its design enables combination or separation of the teaching areas and the main hall (figure 5).

Within the instructional area three open plan spaces create the ‘learning bases’. These spaces are open, ‘welcoming’ and airy, created by natural daylight from the partially glazed ceiling and purposely designed furniture. Each learning base hosts approximately 90 pupils that span two school years with a team of teachers. Each base is formed by three interlinked truncated circles fitted with acoustic curtains that can be easily drawn to separate a group of pupils into smaller configurations as required. When the curtains are opened the space allows for larger groups of pupils to be taught collectively (see figure 6). Circulation zones function as extra spaces for learning, often used for small group activities with a teacher, rather than as a traditional corridor, contributing to more personalised learning through varied and flexible groupings (see figure 7). This flexibility requires teachers and teacher assistants working in teams across the learning base in support of the pupils’ education. These teams work collaboratively in terms of planning, developing and delivering learning for the pupils – no staff can work in isolation. Timetabling is crucial, and needs to be planned in advance, precisely agreed and adhered to.

The school follows a daily schedule where in the morning pupils, across all learning bases, are involved in focused learning activities centring on literacy and numeracy. In
the afternoon children work on projects (either on their own, or in small groups) which have been determined in consultation with their teachers. At the same time, teachers can choose to work with specific pupils who need extra support in the areas covered in the morning.

The shape of the learning bases is important. Author (2016) found, in a study of classrooms in Uruguay, that the spatial occupation and proportions of the space have a substantial impact on the number of pupils receiving high-quality visual interaction with the teacher. Beyond five meters from the educator the drop in the visual interaction is abrupt and pupils dramatically lose visual relation with the sources of information. Therefore, in classroom design, more regular shapes are to be preferred over irregular ones, and long rectangular classrooms with the short side as the ‘front’ are particularly problematic.

In JGPS the regular, circular shaped learning spaces within the bases enhance pupils’ lines of sight and reduce spatial distances to the teacher, ensuring quality and equality of interaction among the protagonists of the teaching and learning process. Additionally, the design encourages more teacher movement through varied presentation options (extensive whiteboard space and the option to project in different places) and the furniture enables pupils to easily position themselves to allow for the interaction to happen (see figure 8). Thus, the individual learning spaces within each base are able to support traditional transmission learning effectively but, as we will continue to show, the school design offers options beyond this pedagogy.

Insert figure 8

**Design for transformation in JGPS**

The school is judged as succeeding in Ofsted’s terms and apparently recognised as a
good school within its local community (based on its steadily increasing roll, with younger year groups now at capacity). Notably, in an area with considerable economic problems and therefore a tendency to reduced educational success, the school has improved student outcomes, as indicated for example by student achievement in the Key Stage 2 SATs. This success is in some contrast to the levels of academic achievement previously recorded by Ofsted in 2004 when teaching was ‘unsatisfactory’ resulting in ‘Standards in the core subjects of English, mathematics and science well below average and below those of similar schools’. Thus, an educational change has clearly occurred in the school alongside the move into the innovative new building, which was designed as part of a programme that aimed to be transformational. It has been repeatedly shown that effective use of open learning spaces requires radical change to teachers’ practices and identities (Saltmarsh et al. 2015), adding to the conviction that transformation in learning has occurred here. The overall success of JGPS can be understood through considering how Gislason’s elements are aligned to produce an effective environment, at both the micro level of various aspects of the design and at the macro level of the school as a whole. As will be discussed further in the final sections, it is this alignment that we believe has enabled the school to avoid many of the pitfalls associated with open-plan or flexible designs, so succeeding in transforming education for these pupils.

**Ecology**

At a macro level, the school was designed to enable flexibility of use and, as described above, space is rearranged by staff to support different pedagogical approaches. At the micro level, ‘agility’ (Dovey & Fisher, 2014) is achieved through the design enabling quick re-organisation, by opening or shutting curtains and movement of light weight furniture into various positions. The provision of innovative, contemporary-style soft
furniture, upholstered in attractive, bright colours is an important aspect of the design, contributing to the flexible use of the space, but also to other aspects of the experience. Their softness suggests comfort, linking to the head teacher’s desire for the school to be cocoon-like, but also has practical implications such as reducing noise. Neither the furniture nor the curtains appear designed for specific positions, so avoiding them being perceived as fixed. However, it is the alignment of the other elements of Gislason’s model (organisation, staff culture and pupil milieu) to support these features of the physical space that enable success.

**Organisation**

Many organisational features, such as timetabling, collaborative planning and the no shoes policy, support the intended use of the physical space. The space is considered to be versatile (or agile) enough to allow for both traditional transmission style pedagogy and other approaches, with this distinction paralleling the school’s enacting of the National Curriculum through core subjects taught traditionally in the morning and more varied groupings for other activities in the afternoons. This enables the attention to ‘basic skills’ in numeracy and literacy, which individual pupils must master to meet national expected standards, to exist side by side with group work and more creative projects. Teachers work as a team to operate each of the bases to ensure an orderly use of space and time during the period students spend in their base each day. Learning activities, content delivery and day-to-day scheduling are all managed collectively to avoid conflicting uses of the space.

The school’s policy on footwear is noted quite directly in the most recent Ofsted report where the judgement is made that it ‘encourages a quiet working atmosphere that promotes effective attitudes to learning’. This comment, in its linking of organisational details and pupil attitudes attests to the dynamic entwining of the various elements of
Gislason’s model as well as suggesting the importance of an apparently inconsequential decision about shoes.

**Student milieu**

Despite the possibility that the openness of the design could lead to off-task social interaction, the pupils tend to remain focused on their own work. During our visit, we noted children moving between areas and activities in a calm, well-organised fashion that suggested positive attitudes and clear expectations for behaviour. This impression is supported by the Ofsted report, which rated pupil behaviour as ‘outstanding’, noting both engagement during lessons and pupils behaving ‘exceptionally well as they move around the school’. They appeared self-motivated and respectful of the need to maintain an orderly learning environment – hence pupil dynamics mediate the effect of the open plan design on behaviour. Moreover, it must be noted that this dynamic appears to be developed through the educational approach, rather than being inherently characteristic of the intake, as has been suggested is sometimes the case where other open-plan schools are successful (see Gislason, 2009, 2015).

**Staff culture**

This final element of Gislason’s model, appears to be very supportive of the educational approach taken, and is underpinned by the head teacher’s clear commitment to the educational vision and her expectations of the staff. She is visible when in her office, and frequently present in the learning space offering respectful and well-informed support to staff. The sense of common cause between the staff and head is enhanced by such interactions. During our visit, she talked about how new staff have to adapt to the Jesmond Gardens way of doing things. Although support is available to help them do this, it was clear to us that failing to adapt is not an option.
The educational culture also enables the success of the no shoes approach, which helps to maintain the soft furnishings in good condition and reduces noise levels. In the UK, in the absence of any expectations from the wider culture that outdoor shoes will be removed, this depends on the staff, and the actions of the head teacher seem crucial. As noted, the no shoes policy applies through the school day to all school users, including the head teacher, contributing to a staff culture seemingly experienced as collaborative and based on teamwork.

**Discussion and Conclusion**

We believe that the alignment of the various dynamic elements of the learning environment has enabled this school to implement change and sustain it over time. This appears to have been initiated through the participatory approach to design but it continues through the day to day functioning of the school, with a very important part played by the head teacher. In this section we will first consider how this ‘design for transformation’ overcame the challenges that are inherent in staff collaboration and those of open-plan or flexible school space, before considering its implications for educational transformation through participatory design elsewhere.

Research evidence is consistent on the considerable challenges of implementing team teaching within a profession that traditionally works very much individually (Hargreaves, 1994). Problems and tensions are found where team teaching is attempted as a way of using shared space (Graue et al, 2007; Campbell et al, 2013) or implemented for other reasons (York-Barr et al, 2007). Within shared spaces, teachers need to work as a team to operate effectively with learning activities, curriculum delivery and movement, all managed collectively to avoid conflicts in the use of the different spaces. As Gislason comments in relation to a school where open-plan design and team teaching is successfully implemented, ‘the staff members have a common
interest in working as teams. Without this kind of underlying culture, the tensions inherent in team teaching could lead to divisiveness’ (Gislason, 2009: 31).

Commitment, planning and time to adapt are required to build such a culture and be able to change to such an environment. At JGPS, there was time for such planning during the construction work, initiated by the participatory design process, and the head teacher described how this opportunity was consciously utilised. She described staff meetings gathered round the plans, using counters as children and discussing timings and movement between activities.

Thus, the teachers were well-prepared for the change. However, studies about co-teaching show that teachers can still tend to feel that the open space ‘forces’ cooperation, and that there is no real way to ‘pull back’ from team work due to the need to co-manage space, time and instruction: ‘a very strong sense of no longer being alone’ (Campbell et al, 2013: 220). This imposed need to collaborate has its drawbacks linked to frictions amongst teachers being uncomfortable with the loss of autonomy and/or difficulties in allocating time for planning and assessing (York-Barr et al, 2007).

Although there was an occasional suggestion of such tensions at JGPS, it appears that staff are mainly content. This attests to the successful alignment of the elements of the learning environment, including the non-architectural factors, within a space that does seem particularly suited to the range of uses the staff wish to put it to. Also, notable here is the leadership provided by the head teacher through the design process and ongoing during the daily functioning of the school, which is clearly an example of ‘the critical role that principals play in supporting change within their school environments’ (Fletcher et al., 2017: 80).

Aside from the challenges of team teaching, an open-plan school design can present other problems, and it has been suggested that these may have contributed to the
demise of open-plan in the UK and US during the 1980s and 1990s. Research conducted during the 1970s showed that designs intended to enable flexibility, of the ‘agility’ variety (Dovey & Fisher, 2014), through different spatial arrangements of furniture for different activities were frequently not used as intended (Bennett et al, 1980; Author, 2011). This is certainly not the case at JGPS, and we have suggested that the ease of rearranging the light-weight furniture, of opening and shutting curtains, of pupils and teachers movement, support the use of different parts of the space in a diversity of ways. It is worth noting also our observation that the school space as a whole is genuinely suitable for the particular variety of distinct pedagogies practiced at different times: the design therefore has ‘convertibility’ as well as ‘agility’ (Dovey & Fisher, 2014), a property that 1960s and 1970s schools designed purely for a progressive ‘integrated day’ (Franklin, 2015) did not include.

Other researchers have highlighted the problem of pupils being distracted within an open-plan learning environment (Gislason, 2010; Campbell et al, 2013), with noise being a particular issue. This does not seem to be a problem at JGPS, and can be partially explained by the successful alignment of the learning environment elements so that the open-plan layout provides teachers with the shared space required for team instruction, which is integral to the curriculum. Gislason’s work shows how a commitment from staff and pupils to a school’s total learning environment can assist an open design in succeeding. However, even at the successful open-plan school he studied, noise was notable and potentially problematic. Similarly, recent research within the new ‘innovative learning environments’ currently being built in Australia and New Zealand suggests that noise remains a concern (Smarden et al., 2015; Mulcahy & Morrison, 2017). Mulcahy & Morrison (2017) describe a school that apparently shares many of the spatial and organisational features of JGPS, and generally appears to work
well, but their research revealed some problems with noise, which concerned some pupils. Vital to the minimisation of noise at JGPS is the removal of outdoor shoes, by staff as well as pupils. Not only do socks or soft shoes make less noise, but insisting on them allows more soft furnishings and carpet than might otherwise be sensible the provision of which further improves the acoustics. Mulcahy & Morrison (2017) make the point that noise can be an issue of affect as well as proving distracting, further underlining the importance of achieving good acoustics in school space. Considering the way that the no shoes policy, as an aspect of organisation, is enmeshed with staff culture, pupil dynamics and numerous parts of the physical design, it becomes clear why the resulting tension with the design of outdoor-indoor linkages may be a price worth paying.

Overall, JGPS illustrates the underpinning relation between design and practice. It is an example of a school where open-plan architecture serves the school’s programme effectively and teachers value the way in which the open space facilitates the collaborative delivery of the curriculum. As we have argued, the success of the learning environment can be understood in terms of the alignment between the interdependent elements: ‘ecology, organisation, culture, and milieu together define environmental quality in schools. Should one of these elements be significantly out of joint (e.g., if teaching practices are poorly matched to their physical setting) then a design may falter in its intended purpose.’ (Gislason, 2009: 32).

However, it could be argued in addition that the school succeeds through particular attention having been paid to some of these (aligned) aspects of the environment. Thus the physical design includes quality finishes such as wood and relatively expensive details, such as the acoustic curtains. Thorough planning, enabled by the timescale of designing and building the school, facilitated careful attention to
organisational aspects, such as pupil movement around the premises. The educational culture found among the staff was partly due to the determination and strong leadership practiced by the head teacher. Finally, the pupils’ milieu contributes positively to the whole, with ‘outstanding’ behaviour conducive to a calm, purposeful learning environment, despite the challenging social and economic circumstances from which many of the pupils come.

JGPS is an example of innovative design feeding through to produce a functional building that continues to be experienced as appropriate for the uses being made of it. This suggests to us the potential benefits of actual, productive collaboration between architects and a school community. The long term satisfaction with the school design counters the accusations of inefficiency made by the James review regarding participatory design. However, it must be acknowledged that the continued productive relationship between space and practice in JGPS has been facilitated by the retention of the head teacher whose vision was so central to the original plan.

JGPS can be judged to have succeeded in transforming the educational experience, as the head teacher had hoped to do, and, as we have seen, the design of the physical space made an important contribution to that transformation. This is despite the known challenges of transforming educational values and practices through designing and building innovative spaces, so we must ask what the experience of this school reveals more generally about space and change. It seems to us that it is important to distinguish between two sorts of transformation: local level and policy-led.

At the local level, as JGPS demonstrates, school space can be a powerful driver of educational change (see also Author, 2018; Fletcher et al., 2017). This requires effort being made to align an innovative design with non-architectural features, and we would suggest that participatory design is a means to do this.
Therefore, from an architectural point of view, it is highlighted the need for a more participatory design process with the users of each school. From the perspective of the school community, it would seem that any time spent on participatory design that feeds through to the actual building will not be wasted. If this cross-disciplinary collaboration is time consuming, this could be because the process is complex rather than because it is inefficient. Experiences during the BSF era of mandated consultation and government advocacy for participatory design support this understanding: ‘The design and building of a school is a complex process that involves a large team of people working together over a long period of time’ (Sutherland et al., 2014).

Yet it is the time and effort, seemingly needed at the local level on every project that results in innovative school design proving so difficult to use to spearhead policy-led educational transformation. Certainly any attempt to ‘roll out’ a particular innovative design across schools risks misalignment with some of their differing staff cultures, organisational practices and student dynamics. The solution attempted by BSF and the parallel Primary Capital Programme, under which JGPS was designed and built, was to require a certain amount of user consultation within a process that, as the comment from Sutherland and colleagues reminds us, necessitates some collaboration. Although research at the time frequently reported the shortcomings of attempted participatory design, ‘this discrepancy between the rhetoric for inclusion and the actual practice of stakeholder involvement’ (Parnell & Patsarika, 2011: 465), researchers were also clear about the potential benefits for students, staff and the resulting school space. Ideas for improvement to the process were suggested including publically funded facilitators, protected and funded time for school staff members to lead change (Parnell et al., 2008) and the sharing of knowledge gained by participants (Newman & Thomas, 2008; Parnell et al., 2008).
While the example of JGPS concurs with assertions about the importance of school space for educational transformation, the experience in this school also makes clear the necessity of architectural change being aligned with other aspects and shows how this can be achieved. The limitation to the power of design alone to transform education is one that policy-makers intent on ‘innovative learning environments’ could do well to bear in mind and suggests instead the continuing need for developing our understanding of participatory design. Taking seriously the suggestions for improving collaboration seems more productive than dismissing it as provoking ‘dysfuntional behaviours’ (James, 2011: 21), and this implies directions for research as well as policy. Specifically, our case study shows the benefits of looking beyond the initial participatory design process, important though that is, to appreciating how the designed space goes on to be understood and used.

Acknowledgements

References


Fig 2

Fig 3