

The risks of standardised school building design: Beyond aligning the parts of a learning environment

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Abstract

School design in any epoch reflects the collective values and attitudes of the time, and the political currents which shape perspectives. In this paper, we consider the risks associated with an English school's rebuilding under the Priority School Building Programme, a standardised approach to school design, tending to result in 'traditional' instead of 'innovative' designs. At a micro scale, risk is affective, influencing educators' ontological security. We also consider the macro-level risk of shaping citizens through education policy reflecting particular values. This case study, in a UK secondary school, explores theoretical frameworks that can be used to investigate risks involved in rebuilding projects. It is well established that misalignment between structural resources, approaches to pedagogy and social relations presents a significant risk for school redesign. Although the case study project was a relatively smooth transition at the local level, with alignment between set, epistemic and social design, we argue that there can be a philosophical risk associated with conservatism in schooling design and a focus on performativity and conformity. Giving consideration to policy-led schooling decisions, we argue for the importance of alignment between design elements in the context of wider consideration around the purposes of education.

Keywords

School buildings, learning environments, educational change, innovative learning environments, alignment, Activity Centred Analysis and Design wireframe

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Introduction

Change and innovation in education require practitioners to reimagine the status quo and envisage new ways of working that are potentially ‘problematic, disruptive and challenging’ (Morrison and Kedian, 2017: 1) and are necessarily risky. In this article we argue that risks are always present in the reinvention of schooling environment design and these risks can be seen at various levels of activity in schools and schooling systems (societal – school – teacher/classroom). Furthermore, school building initiatives that are implemented to mitigate some risks can accentuate others, perhaps undermining, or even jeopardizing, conceptions of education that align with 21st-century learning discourse (Leat et al., 2012). This future-focused conception of education highlights the value of preparing students for success in the globalised, 21st-century knowledge economy. The design and development of innovative and open new school buildings and refurbishments of existing facilities have been linked with associated pedagogical practices that aspire to prepare students for citizenship and employment in the 21st-century global economy (Benade, 2019).

Non-traditional school design which has grown in popularity across the Organisation for Economic Co-operation and Development (OECD) from the beginning of the 21st century is characterised by the mix of open and intimate spaces, fewer walls and more glass than single cell classrooms (OECD, 2017). The learning areas may include ‘polycentric room designs, infused information and communication technologies, flexibility brought about by moveable walls and other agile interior elements, a variety of student friendly furniture and ready access to resources’ (Imms et al., 2016: 6). In Australia and New Zealand there has been a proliferation of new buildings that reflect the impetus to design for flexibility of educational uses (French et al., 2020; Woodman, 2016), personalised learning (Cardno et al., 2017) and co-teaching (Mackey et al., 2018). Across Europe, building projects address the impetus to prepare students to be future global citizens, while celebrating variation and national idiosyncrasies (Woolner, 2019). In fact, research has shown that with respect to education policy there is no pan-European ideal; rather, individual countries put into practice their own values with ‘national imperatives’ typically ‘outweighing EU frameworks’ (Leat et al., 2012: 402). Building design in Europe similarly follows these national imperatives, with these open and flexible designs much more prevalent and currently preferred in some countries, such as the Nordic countries (see e.g. Grannäs and Stavem, 2020; Sigurðardóttir and Hjartarson, 2011), than in others, where enclosed classrooms prevail even in new buildings (see e.g. Duthilleul et al., 2019).

In this article we address a central question: what are the respective risks of standardised, traditional school designs and tailored, innovative learning environments intended to fit a school’s educational aspirations? As the risks of innovation in school design become more evident (French et al., 2020), it is important to consider in detail the evident alternative of reverting to standard, traditional school space. By ‘traditional’ we mean school designs centred on enclosed classrooms, most suitable for one teacher and one class, typically engaged in the same learning activity. Educational risk and performativity discourse (Ball, 2003) are used as a framework to consider risk-taking in the UK school building policy context, where the retreat from attempts at tailored innovation to standardised designs is well underway. We provide an account of the experience of an English secondary school rebuilt under the Priority School Building Programme (PSBP), which replaced the Building Schools for the Future (BSF) programme after a change of government in 2010, and resulted in a changed approach to both the design process and the resulting school buildings. We move from the application and examination of frameworks proposed to understand or assess learning environments (Carvalho and Yeoman, 2018; Gislason, 2009, 2010, 2015, 2018; Yeoman and Wilson, 2019), to consider how the alignments or discontinuities they reveal relate to the risks of educational innovation, in this school and elsewhere.

Our case school's environment is assessed against these frameworks, and we consider the possibilities of aligned and unaligned environments that are more or less innovative. This leads us to theorise the risks associated with these differing solutions to the challenge of school design. It is possible to see PSBP as an attempt to minimise the risks of school design, with its efficient provision of standardised settings for existing educational practices resulting in aligned environments, if not innovative design. Although this might seem preferable to the discomfort of an unaligned environment, experienced as a risk at the local, user level, we will, through a typology of risk, consider the risk in other places within the educational and societal system.

Educational risk and performativity discourse

Risks are projections of an uncertain future and therefore are at least partially hypothetical (Zinn, 2008). Risk inhabits the nexus of realism and constructivism (Beck, 2009a). As Beck (2009b: 90) observes, '[d]iscourse politics and coalitions within institutional contexts of decision, action and work' are influential in how risk is framed and perceived. It involves an assessment of 'the uncertainties associated with the outcomes of decisions' (Nielsen and Faber, 2019: 1), and any calculation of 'risk' involves values, as there is a normative component which can be negotiated and contested (Boholm, 2003). 'Ontological security' is the assurance that educators receive from experiencing 'a sense of continuity in relation to their self-identity and in the constancy of their surrounding social and material environments' (Le Fevre, 2014: 57). Educational change, including that associated with building redesign, can threaten this ontological security. There can be change involved that requires educators to reconsider the purpose of what they do, their philosophical approach to pedagogy, and even their identities as effective teachers. Considering radical pedagogical change across European countries, Leat et al. (2012: 409) comment on the 'fertile ground for confusion and stress on identity for teachers and students'. Therefore, the perceived risk associated with the whitewater of change can affect teachers emotionally (Howard, 2013). When the physical, social and cultural structures of schools are radically transformed, with their storehouses of memories, the risk can feel like 'institutional homicide', where practitioners experience grief and loss (Le Fevre, 2014: 57).

The literature on non-traditional schooling design has signalled a range of risks associated with the pedagogical affordances of spaces, the capacity for student learning, and the nature of teachers' work; risks which are operating at the classroom or school level. Students can become distracted in open spaces, movement of students in classroom spaces can risk loss of instructional time, and there may be a sense that visual and acoustic control within classroom is diminished due to the building design (Gislason, 2015). Teachers may experience a loss of instructional autonomy with the pressure to co-teach in open spaces (Alterator and Deed, 2013; Campbell et al., 2013). There could be risk that the affordances of co-teaching in non-traditional school spaces may be underutilised if there is failure to agree on mutually developed goals, and no shared belief in co-teaching (Mackey et al., 2018). There is a risk of dissonance when diverse teaching teams fail to reach a consensus around a shared epistemology of learning (Carvalho and Yeoman, 2018). There may be tension over the allocation of work and issues with the increased need for communication between teachers (Gislason, 2015). Although these are risks that could be problematic, the research in new, innovative learning spaces is providing advice on how to manage such local risks. For example, Mackey et al. (2018) recommend leadership practices that permit risk-taking and recognise mistake-making, while Deed et al. (2020) focus on teacher agency, as teachers collaborate to establish new ways of working in new spaces.

Risk-taking and aversion also operate at the macro scale across education systems through policy implementation, both national and supranational. Governments legislate policies for education systems that can take a visionary or conservative stance toward school building projects and this filters

though into the affective politics of school settings. However, in the early 21st century, policy has been informed by influences beyond the national, specifically those of neoliberalism. In his book *The Beautiful Risk of Education*, Gert Biesta (2013) asserts that relationships in education have been replaced with logics of the market. This is where the focus of learning has moved ‘attention away from the importance of relationships in educational processes and practices’ (63) and onto educational accountability, and associated regimes that seek to minimise if not totally eradicate risk in education. Aversion to risk, asserts Biesta, is ubiquitous in education: ‘They [policymakers, politicians, the popular press, ‘the public’, and organizations such as the World Bank] want education to be strong, secure, and predictable, and want it to be risk-free at all levels’ (2013: 1). Risk is relational as it is embedded in cultural politics and reflects structural conflicts in educational settings.

Risk aversion at various levels within the education system can be associated with accountability structures that align (and even constrain) pedagogy to evidence-based instruction (McKnight and Morgan, 2019) and mechanisms of performativity (Ball, 2003). Performativity involves market logics where schooling is commodified and there is intensified accountability for all stakeholders. In schools, ‘control of the institution is maintained through monitoring and supervision and the constant gathering of knowledge and data about its ‘effectiveness’ ’ (Perryman et al., 2018: 147). Nineteenth-century public schooling design, influenced by the work of Jeremy Bentham (1791), reflected an impetus to surveil and control young people (Grosvenor and Rasmussen, 2018) and foster morality in them so that they would engage in appropriate social behaviour (Norlin, 2018). The risk narrative was the child’s soul and the ongoing gatekeeping of social norms and power structures. However, inefficiencies of the market now also have salience and this is apparent in the UK school building policy context after 2010 (James, 2011). This focus, as we shall outline, brings with it a raft of different risks.

Risk-taking and risk aversion in the UK policy context

In the UK, the ‘Building Schools for the Future’ (BSF) programme reflected the worldwide interest in educational building (Mahony et al., 2011) together with a national need to rebuild and renovate the then ‘deteriorating school infrastructure’ (Clark, 2002: 3). ‘Building Schools for the Future’, which ran from 2003, was intended to ‘transform’ education through building facilities designed for the ‘future’ needs of each school (Department for Education and Skills (DfES), 2002). However, as Watson (2007: 255) noted at the time, ‘the focus of much of this work is on stunning architecture but real success [relies] on the interplay and partnership between architecture and educational purpose’. Critiques of BSF have pointed to the lack of definition of ‘transformation’ (James, 2011) and to the problems of designing for an undefined ‘future’ (Wood, 2017).

Research is beginning to suggest that aspects of the non-traditional designs of many BSF schools are proving unpopular in use (Daniels et al., 2017; Wood, 2017). The James review (James, 2011) of BSF which was launched by the Secretary of State also criticised the involvement of staff and students in planning their schools, suggesting that schools were becoming ‘far too bespoke’ (5). The move to PSBP prioritised a standardised approach to school design (Livesey, 2012) which excludes intensive participation in design and therefore reduces the possibility of individualised, innovative buildings. The Education Funding Agency (EFA) developed a set of baseline designs that included a suite of standardised drawings and specifications that could be applied to primary and secondary schools building projects. The designs were developed as fast and efficient briefs that could be deployed with local planning departments and construction consortiums. Contractors could use them to flesh out into detailed schemes for the builds.

The UK government expects that the baseline designs will evolve in response to feedback, however the specifications (e.g. wall to floor ratios and the use of orthogonal forms with no curves or

'faceted' curves) are tightly prescribed. (Government UK, 2014). These standardised designs were intended to be functional, yet relatively inexpensive, and adapted to the size and site of the school. They are fairly traditional, especially for secondary schools, comprised of enclosed classrooms along corridors.

Frameworks that can be used to understand the dimensions of learning environments

Having considered the context of the case study rebuild and the ideas of risk that will prove vital in understanding the outcomes, we now consider approaches to evaluating the new school environment that was designed according to the baseline designs. In looking for frameworks that could be useful in understanding and evaluating a specific learning environment, it is important to begin from a conceptualisation of learning as inherently situated in material physical settings.

Gislason (2009, 2010, 2015, 2018) draws on research into school culture and leadership to propose a framework that centres on the interconnections between physical space, organisational practices, staff educational culture and student dynamics, which, as complementary aspects of the learning environment, need to be aligned with one another. These four elements, which Gislason presents diagrammatically as overlapping and interconnected, comprise: organisation, including scheduling and curriculum; staff culture, understood as the underlying teaching values and beliefs of teachers; student dynamics, the motivation, behaviour and social climate of students; and ecology, considered as the building design, technology and other material elements (2015: 115).

This theoretical framing, however, is limited by its location within one level of the educational ecosystem. Although it would be possible to use it to assess a micro-level learning environment, such as a classroom, or to consider the macro level of an educational system within a nation state, it has most often been used to evaluate at the school level (Cardellino and Woolner, 2020; Gislason, 2015, 2018; Woolner and Tiplady, 2016). Furthermore, such alternative applications would require separate evaluations at the various levels, so the framework appears most suitable to within level rather than across level analysis.

Consideration of actions at cultural, structural and individual levels has proved useful in exploring educational changes (e.g. Priestley et al., 2011). This theorisation has been combined with Fullan's stages of change (e.g. Fullan, 2007) to create a framework with which to investigate change that is based on altering curriculum, pedagogy and space (Woolner et al., 2018). These conceptualisations, however, are most appropriately applied to a reform or initiative developed over time as opposed to the sudden change represented by a rebuild where user involvement in the process is minimal.

We now turn, therefore, to a theoretical framework that explicitly considers various aspects of the learning environment (material, epistemic and organisational) at different levels and is suited to studying two relative static situations, before and after the rebuild. This is the Activity Centred Analysis and Design (ACAD) wireframe (Yeoman, 2015; Yeoman and Carvalho, 2019), which was developed from the Activity Centred Analysis and Design framework (Goodyear and Carvalho, 2014), an earlier conceptualisation of designing for learning that was developed in the field of educational technology (Goodyear, 1999) and based on the 'pattern language' of Alexander et al. (1977). The resulting ACAD wireframe (Table 1) connects various levels of pedagogical understandings, from underlying philosophy through to micro-level 'detail', to three aspects of the educational setting: the environment, the tasks and the organisation. The framework thus combines scale levels with three dimensions of situated, and potentially designable, learning: the physically situated 'set' of artefacts and resources, the epistemically situated tasks and the socially situated organisation of learners.

Table I. The Activity Centred Analysis and Design wireframe (drawn from Yeoman and Carvalho, 2019: 69).

<i>Philosophy</i>	SET DESIGN <i>Learning is . . .</i>	EPISTEMIC DESIGN <i>Learning is . . .</i>	SOCIAL DESIGN <i>Learning is . . .</i>
MACRO The global Level I patterns	Buildings and technology	Stakeholder Intentions	Social systems
MESO The local Level II patterns	Allocation and use of space	Curriculum	Community
MICRO The detail Level III patterns	Artefacts, tools and texts	Selection, sequence and pace	Roles and divisions of labour

**Figure 1.** Part of the old school premises (left) with the new building under construction.

These two theoretical frameworks, the ACAD wireframe and Gislason's model, can be used as heuristics to enable researchers to consider 'alignment' between elements (Gislason, 2015, 2018) and to 'mapping design intentions across the . . . dimensions (Yeoman and Wilson, 2019: 2093). In both frameworks, success is understood to result from elements or dimensions that are aligned, rather than in conflict. We will use them to consider the alignment of the new school environment created in our redesigned case school, putting these analyses alongside our understanding of the process of the rebuilding to develop our framing of the rebuild in terms of risk.

Methodology

Having outlined the context of the PSBP school rebuilding project that we investigated and proposed some frameworks that might be used to analyse the resulting design, we will now introduce the school, the research aims and the methodology that was adopted, before presenting an overview of the data collected.

The school itself is a mixed, comprehensive high school (students aged 13–18) with around 750 students on roll, which when we started the research was housed in a collection of buildings, mainly dating from the 1950s, but with some newer blocks built in the 1990s, with the new premises under construction on the same site (see Figure 1).

The overarching aim of the research was to discover how changing the built environment was understood and experienced, as it happened, by this school community. This included investigating the extent and nature of any impacts on student attitudes and behaviour, the anticipations and experiences of support staff and the role of the school head in leading and managing the change. Together with the formal data collection detailed below, school visits and more informal discussion with the head teacher and other staff occurred throughout the research period (November 2015; February, August, September and November 2016; June 2017). The time that has now elapsed since the move into the new building has enabled some additional informal observations, both as part of the feedback process to the school leader and governors, and through the first author's continuing involvement with the school as a local community member and parent.

Our focus on one school clearly makes this a case study in the broad sense of a small-scale study, but this is a vague definition that has been criticised (Tight, 2010). However, we also argue that our aims, centring on a 'how' question, and the setting for the research within contemporary events over which we had little control fulfil Yin's (2014: 14) essential criteria of case study. Furthermore, to investigate our case 'in depth and within its real world context' (Yin, 2014: 16), we brought together 'multiple sources of evidence' (17), as detailed below. While we recognise the apparent limitations of basing conclusions on the experience of just one school, our intention is to generalise through highlighting patterns (Larsson, 2009) of interaction between policy, practice and school design that will be relevant beyond this new school and the UK's development of its school infrastructure.

Data collection

Within each research phase, before and after the move, a range of data was collected, and a number of meetings were held with the head, and it is the information generated in these ways that we seek to understand retrospectively through fitting the frameworks introduced above and considering risk. To maximise the validity of before and after comparisons, given the seasonal nature of school activities, data were collected at the same time of year in 2016 and 2017. Data were generated through staff and students focus groups centred on visual and spatial activities (Woolner and Clark, 2015; Woolner et al., 2010), and a student questionnaire including items from a National Foundation for Educational Research (NFER) survey of student attitudes in a secondary school rebuilt through BSF (Rudd et al., 2008). This enables comparisons with student attitudes and experience of change through a BSF rebuild.

Before the move:

- Focus groups (mapping and diamond ranking activities) and site visit with 12 support staff: February 2016.
- Questionnaires completed by 237 students (112 from Year 9; 125 from Year 10): March 2016 – the questionnaire included questions from an NFER survey of student attitudes used before and after a secondary school moved into a new building (Rudd et al., 2008). This enables comparisons with the limited improvements in student attitudes to learning found by that research, which took place in the context of a BSF rebuild with the possibility of more involvement of staff and students in the design process.
- Mapping and ranking activity with seven Year 9 and Year 10 students (School Council members): April 2016.



Figure 2. After the move, research participants sort descriptive words according to whether they apply to the old school, new school or both.

After the move:

- Focus groups (mapping and sorting descriptive words; see Figure 2) with 12 support staff (mainly the same people as in 2016): April 2017.
- Questionnaires completed by 414 students (155 from Year 9; 149 from Year 10; 110 from Year 11): March 2017.
- Mapping and sorting descriptive words with eight Year 10, Year 11 and Year 12 students (School Council members, mainly the same people as 2016): April 2017.

Findings

Before the move into the new building, we found plenty of positive anticipation, but also an awareness, from the head teacher at least, of the risk and potential benefits of attempting change alongside the inevitable stresses of moving into a new building. Consistently voiced by the head teacher during the research was her aim of using the move into the new building to ‘make a fresh start’, that this was a ‘real opportunity’ to improve education here and be seen to do so. Her decision to impose a change to the school uniform, making it more formal, was part of this understanding of the change process. However, she was also aware of the possibility that ‘some of the character will go’ and that it was necessary to be explicit about ‘taking the ethos with us’.

Student responses to the first questionnaire suggested a generally positive attitude to the school as well as conveying expectations for the new build. Specifically, questionnaire responses were positive about how school makes them feel, how much they expect to achieve and regarding potential problems. Asked about their intentions after Year 11, the majority position was to stay on at this school, suggesting a general commitment to the school. Over all questionnaire items, students tended to be more positive than were the NFER students in their old building (Rudd et al., 2008: 3), but this difference only reaches statistical significance for some items. Regarding the design of the old premises, students were reasonably agreed that the existing buildings were ‘boring’, but not ‘inspirational’, ‘stimulating’, ‘colourful’, ‘motivational’, ‘over-whelming’, ‘exciting’ or ‘scary’. There were more mixed views on whether the buildings are ‘comfortable’ and ‘relaxed’.

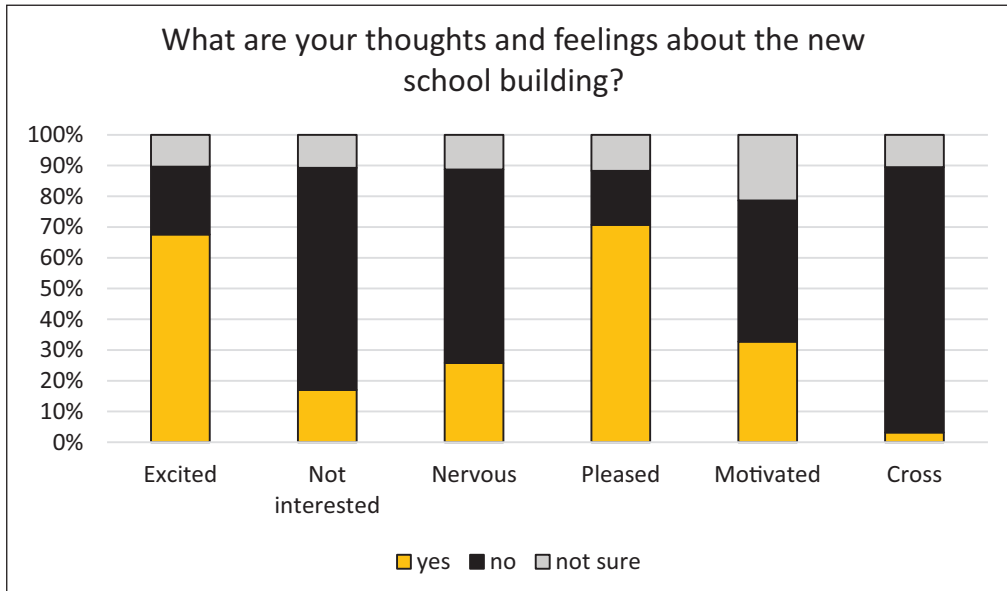


Figure 3. Student questionnaire responses to items about anticipations of the new building.

A comment and response made during the mapping activity during the student focus groups conveys students' feelings of affection for parts of the premises together with awareness of failings due to age:

Student A: 'The humanities block is quite good . . .'

Student B: '. . . but it has seen better days.'

In anticipating the new building, student focus group participants seemed interested and hopeful. The student questionnaire similarly showed that a sense of positive expectation about the new building was shared across the student body (see Figure 3).

Furthermore, categorising the responses to the open question about the design of the new building according to whether they were broadly positive, negative, neutral or mixed revealed a similar picture (two-thirds of those who responded to this item wrote a positive comment), with negative responses and mixed views often due to negativity about the change of school uniform.

The second phase of data generation, after the move into the new building, revealed a broad continuity of positive attitudes towards school life amongst students, although with some minor changes, to be discussed below. The student questionnaire and the focus groups with staff and students suggested how the new building was being perceived and used, showing some discontinuities with the old building. Quantitative comparisons made across questionnaire items relating to attitudes of students before the move and of the same students once moved into the new school (following Rudd et al., 2008) revealed very little change, with students still feeling broadly positive about life at this school. Two notable differences were a statistically significant increase in the proportion of students who would 'currently recommend this school to another student who was thinking of coming here' (Chi-Square test: χ^2 ($df=3$, $n=443$) = 7.926, $p=0.048$) and a statistically significant, negative change in whether students 'feel valued' by the school (Chi-Square test: χ^2 ($df=3$, $n=490$) = 9.524, $p=0.023$).



Figure 4. Collations of opinion stickers for support staff (left) and students (right) on plans of the new school.

Across the maps produced by the support staff there was much agreement expressed about the benefits of the new school premises, with the new toilets mainly liked. Meanwhile, on the student maps, collation of opinion stickers shows considerable, consistent satisfaction with the classroom space, which the students linked directly to their judgement that the ‘teachers are more enthusiastic’. Figure 4 shows the collations of these opinion stickers while also conveying the nature of the school design.

Responses to the student survey items about where learning takes place and is enjoyed showed a lot unchanged in the use of space but suggested heightened awareness of information and communications technology (ICT) resources and the sports hall, alongside increased recognition of classrooms being places where students ‘enjoy learning’. One student’s dislike of the new-style toilets was not reflected in other focus group comments or indeed in responses to the student survey. The students commented on the visibility of the teachers due to the design, which enables clear views down long lengths of corridor, and they tended not to like the windows between corridor and classrooms (‘Everyone stares at you’). This sense of feeling watched, and not liking it, also comes through in some of the responses to the open question about the design of the building on the student survey (‘Windows in the classroom for people to look in and out are horrible’ and ‘Cameras are constantly watching all the kids’).

The second focus group activity, sorting words to describe the new and old schools, revealed agreement across the staff and students that the new school is *light*, *tidy* and *modern*, while they all perceived the old premises as *cluttered*, and the staff additionally saw the new as *impressive* and *inspiring*. The term *happy* was applied by most participants to both schools; *welcoming*, *spacious*

and *safe* were applied by staff to either both schools or only the new building; *noisy* and *safe* were applied by most of the students to both schools. The student survey indicated a parallel sense that the new building is in many respects perceived to be similar to the old. Only in reaction to describing the school with the words *colourful* and *scary* is the new building different (less colourful, but also less scary). Among the students, there were some who sorted *friendly* and *familiar* so they applied only to the old building (one Year 10 student commented that ‘the old school was friendly . . . just the atmosphere’). Perhaps related to this, a survey comment from a Year 11 student stated that ‘the old school was just more fun’ and some of the discussions in the student focus group suggested some sense of sadness because, as the same student said, ‘[t]he old school had a lot of memories associated with it’.

The open question on the survey about the design of the new building provoked a lot of negative comments, with many students noting the lack of colour (mentioned, negatively, by 59 students out of the 330 who wrote comments) and suggesting that the school looks (and in one case smells) ‘like a hospital’ (66 mentions of ‘hospital’). However, the survey also revealed change in student views about ‘problems’ that can be linked to design features such that concerns about vandalism, graffiti, litter, bullying and smoking were all significantly decreased after the move into the new building.

Overall, after the rebuild, there was some evidence of improved use by staff and students of certain spaces, less concern about some environmental problems, and consistent satisfaction with the cellular classrooms and specialist teaching rooms. Despite a tendency for students to be critical of the design of the new building, there was an increase in the proportion who would recommend the school, alongside overall stability of student attitudes towards the school and to learning, together with agreement that many characteristics of the old premises had been carried over into the new.

Discussion: the success of the design of the new premises

Noting the users’ sense that the rebuild enabled many of the characteristics and uses of the school to be carried over to the new building, alongside its traditional design, we will now use the frameworks introduced above to explore the functioning of the new school premises. Using Gislason’s framework (see Table 2) it is possible to see how the foundational aspects of the built environment (the specialist teaching spaces and enclosed classrooms) and the organisation (National Curriculum timetabled in single subject lessons) are very comfortably aligned, supported by features of the staff culture (particularly concerns with student targets and school performance league tables) and student dynamics (awareness of individual targets) that we are assuming to hold in this school based on our knowledge of the current UK context.

Even allowing for the assumptions we are making about staff culture and student dynamics, it is striking how aligned the elements of the new school learning environment appear to be. Learning seems to be taught and assessed as subject-specific skills and knowledge demonstrated by individual students. This is supported effectively by specialist spaces for the natural sciences and arts subjects, with the enclosed classrooms and interactive whiteboards (IWBs) for other subjects also seeming appropriate for the teacher-led instruction that generally accompanies this sort of learning. As Gislason (2018: 187) has reflected recently, ‘[d]esigning a conventional school is relatively straightforward because the standard classroom model is deeply rooted in history and it supports traditional teaching well’, and this seems to be the true for our case school. The other aspect of the ecology that is evident in Table 2 is the designing for visibility and, perhaps, surveillance. This aspect of the build is harder to connect to the teacher-led, subject-dominated learning but it does not seem to be in conflict with it.

The ACAD framework (Yeoman and Wilson, 2019), with its explicit concern with underpinning philosophies and its levels within each dimension, can help us to explore further. In Table 3, we

Table 2. Gislason's (2015) framework applied to the new premises, with characteristics categorised according to whether they emerged from the findings (in bold) or are extrapolated from knowledge of UK context.

Ecology	<p>Single building and fenced site with one main entrance</p> <p>Enclosed classrooms and specialist teaching spaces arranged along corridors</p> <p>Clear views down long lengths of corridor and glass between corridor and classrooms</p> <p>Modern toilets combining open wash area with completely private cubicles</p> <p>WiFi through school, desktop computers in some rooms; IWBs in all teaching rooms</p>
Organisation	<p>National Curriculum and public exam syllabi</p> <p>Timetable of one-hour-long single subject slots</p> <p>Teacher-led lessons with mix of whole class, group and individual learning</p>
Student dynamics	<p>Broadly positive about schooling</p> <p>Broadly positive about this school</p> <p>Sense of community</p> <p>Awareness of target grades</p> <p>Individualised learning with some limited autonomy</p>
Staff culture	<p>Role and job distinctions</p> <p>Concerned by individual student targets</p> <p>Awareness of school performance as measured by student grades and made public in league tables</p>

IWBs: interactive whiteboards.

equate the macro, meso and micro levels with the overall school, internal structures and classroom-level activities respectively within the case study school. We have categorised characteristics according to whether they emerged from the findings (in bold) or are extrapolated from knowledge of UK context.

There is clear alignment across the elements of design (set, epistemic and social) as well as between the three levels, if they are designated as whole school, internal structures and classroom level. Thus, there appears to be comfortable alignment within the school as a whole, as also suggested by Gislason's framework, with the ACAD wireframe additionally showing alignment between the levels within this school system. It is evident, however, that aspects classified at the whole school level, such as the National Curriculum and the building design itself, are determined at a higher, policy level. This throws into sharp relief the fact that the three levels as interpreted here have not captured these higher societal or policy-level perspectives. Attempting to include them as the underpinning philosophy, as we have done, begs the question of which of the two competing systems of epistemology identified by Leat et al. (2012) should be included here. Notably, it is the 'conventional understandings of school learning' rather than the 'paradigm shift' that would 'explode' such understandings (Leat et al., 2012: 401) that sit most comfortably with our observations of the new build. This question of the choice of underlying philosophy will become important as we consider the rebuild in terms of risk at different scales.

Risk and learning environments

The mixed picture presented in this case study suggests that there can be inherent risks in any change that involves a new building. As the head teacher was aware, risk is present even where design is standardised and traditional, rather than individualised and innovative.

Table 3. Activity Centred Analysis and Design (ACAD) wireframe applied to the new premises.

	Set design	Epistemic design	Social design
Philosophy of learning	Standardised for current practices (or tailored for future needs?)	Individually constructed understanding of pre-determined knowledge Teacher-led (or competences for knowledge economy?)	Autonomy Individual responsibility Respect (or collaboration of 21st-century skills?)
MACRO Whole school	Single building and fenced site with one main entrance Formal school uniform	National Curriculum League tables of school performance	'Safeguarding' Transparency Surveillance
MESO internal structures	Enclosed classrooms and specialist teaching spaces arranged along corridors Clear views down long lengths of corridor and glass between corridor and classrooms Modern toilets combining open wash area with completely private cubicles	Subject based departments Timetable of one-hour-long single subject slots	Times and spaces for informal activities and interactions Student sense of community
MICRO classroom level	IWB in each classroom Student seating to face front (together with some circular and grouped tables)	Student target grades Individual learning (with some group work)	Awareness of target grades Individualised learning with some limited autonomy

IWB: interactive whiteboard.

The design of the new building was experienced as broadly successful and our explorations with both Gislason's framework and the ACAD wireframe show that the elements of the learning environment are essentially aligned. Thus, the use of a standardised, traditional design would appear to have minimised the local, school-level risks, specifically those of an innovative space unaligned with traditional practices that we discussed earlier. Notably, this provision of a standardised setting for existing educational practices has not removed all the local risks, as there was some negativity among the students after the move relating to the design of the new school. Specifically, there was a perception amongst students that the design, with its functional style and few colours, was institutional or even clinical, while the passive surveillance features (internal windows and sight lines along the corridors) were disliked. It seems possible that these misgivings about the design, and student understandings of the priorities they represent, are linked to the statistically significant negative change in whether students 'feel valued' by the school. However, no other negative changes in student attitude were found and there was also broad agreement that many characteristics of the old premises had been carried over into the new. Overall, the evidence suggests that the head teacher's approach had been successful in enabling a smooth transition to the new premises ('taking the ethos with us') while minimising the risks of the changes, including the hoped-for 'fresh start', being experienced as too uncomfortable by staff and students. That this was easier for her to achieve in the context of a traditional school design, which did not put additional strains on teachers' and students' practices and

identities, is not to diminish the consideration she gave to it, and underlines the importance of responsive leadership, as noted by researchers studying more challenging transitions into more innovative school space (Morrison and Kedian, 2017).

Yet not all educational risks are experienced at the local level within the school. Introducing the 'super-scale' understandings of learning that might be expected to sit above the broadly aligned within-school levels of scale makes clear that a comfortable fit is only achieved if these are the traditional conceptions of schooling. Recent educational policy in the UK suggests that these assumptions do indeed continue to hold, despite international attempts at epistemological change (Leat et al., 2012). Yet, if a shift was to occur in policy, then the school infrastructure built through PSBP could yet prove to be an extended example, but at government level, of the wasted investment that French et al. (2020) highlight, where school design does not align with intended use. Perhaps more insidiously, the other risk for the UK is that these beliefs persist at national policy level, but are overtaken by societal understandings so that students, teachers and communities emerge out of the 'epistemological fog' (Leat et al., 2012) with a new understanding of school learning, but buildings that do not match.

The discomfort of misalignment in the learning environment might then be felt in a number of places in the system, including within the school as teachers struggle to break down subject barriers and develop collaborative approaches while enclosed in classrooms. Thus, even at the local level, where currently the PSBP provision of standardised, traditional school designs is a performative approach (Ball, 2003) that seems broadly successful at minimising risk, the solution might not be long-term. This, then, is the message for nations across Europe wrestling with the challenge of designing for education: although the local risks of innovative design are becoming evident and are concerning, the retreat to tradition does not necessarily dissolve these local risks even while introducing new, higher-level risks of investing in school infrastructure that is not aligned with wider conceptions of learning that might yet gather pace.

On the surface it currently appears that micro- and meso-level risks have been managed well. However, there is a paradox in what appears on the surface to be a good news story of a school rebuilding project that went smoothly. Paradoxically, the risk-averse PSBP school rebuilding initiative can undermine *the vision for creativity in school design* and the associated impetus to support evolving pedagogical approaches that align with an imaginary for future workplaces and relational structures in communities. The PSBP, though risk averse in its political origins and ethos, risks being inflexible and resistant to the ongoing 'super scale' changes reflected in understandings of education, providing a model of schooling that is out of touch with the expectations for evolving social relations in European societies.

Conclusion

In this article we have presented findings from research into the change process of one school rebuilt through the PSBP. We conceptualised risk in relation to performativity discourse that informs both schooling design policy and the work of educators under the PSBP. Morrison and Kedian (2017: 2), writing in an Aotearoa/New Zealand context where there is more similarity to the UK BSF policy, make the observation that non-traditional learning environments 'represent a substantial philosophical shift away from a system that prioritises the preparation of individuals for the marketplace towards a more inclusive notion of preparation for life'. The risk-averse moves in the UK toward PSBP (James, 2011) constitute a less flexible and adaptable approach to future-focused learning, suggesting instead a retrenched alignment with 'preparation of individuals for the marketplace' (Morrison and Kedian, 2017: 1).

We have provided an account of frameworks that can be used to understand the dimensions of learning environments, however designed, in schools across Europe. In applying these frameworks to a case study, we have provided an account of the respective risks in reproducing standardised, traditional school designs and in tailoring, non-traditional schooling designs that are intended to fit a particular school's educational aspirations. One could assume that by taking a risk-averse approach, as in the PSBP, there would be benefits in the standardisation of design and the alignment entailed. However, by taking a performative pathway where inefficiencies of the market have led to a regressive approach to school building design (James, 2011), there is a risk that the buildings are not suitable for the shifting aspirations for 21st-century learning. Biesta (2013: xi) argues that

'any attempt to make education into a perfectly operating machine' is too high a price to pay and 'ultimately turns education against itself'. . . any engagement in education—both by educators and by those being educated—always entails a risk [and] we should embrace this risk and see it as something positive that properly belongs to all education worthy of the name.

The performativity of standardisation could come at too high a price if the future-focused fluidity associated with the 21st-century imaginary for learning that is embedded in tailored innovation in building design is overlooked. For school infrastructure across Europe, the risk aversion associated with maintaining the educational status quo through performativity and conservatism in schooling design (whether through retaining traditional designs or retreating to them) could paradoxically lead to a greater risk – the risk of a missed opportunity to embrace a broad conception of evolving pedagogies. Therefore, when reviewing alignment between design elements in school buildings, wider consideration should be given to the purpose of schooling and the philosophical goals that are held for children and the broader society.

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