Teachers Preparing For Changes to Learning Environment and Practices in a UK Secondary School

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Paper presented at ECER 2013, Istanbul 10-13 Sept 2013

Abstract
This paper considers teaching staff preparing for new premises intended to facilitate enquiry learning. The existing school consists of self-contained classrooms and teachers mainly teach alone. In the new building there will be large, shared spaces, facilitating movement and different groupings of students and encouraging autonomy for students and teamwork for teachers.

We worked with teachers and students to explore current experiences, and anticipations for the new building, centred on an ‘experimental week’ of enquiry learning that took place in an existing large space (a school hall). We have reported the perspective of the students elsewhere (Woolner et al, 2012a) and in this paper we will explore the experiences of the teachers involved, particularly their ideas about the potential for changing practices.

We met the teachers before and after the experimental week, observed the week and conducted interviews. The first day, using images and student statements to mediate discussions about teaching and learning, was intended to support staff in planning the experimental week. After the week, the team met groups of teachers to facilitate reflection on the experience and conducted individual interviews with some teachers mediated by photographs of the week.

The tensions and stresses of attempting to make extensive changes to teaching practices were evident.

Introduction
The physical spaces of education have a complex, dynamic relationship with the activities that take place in them. Although a relationship has been found between style of setting and teaching practice (Horne Martin, 1999, 2002; Sigurðardóttir & Hjartson, 2011), other evidence suggests that this is not deterministic (e.g. Bemnett et al., 1980), and the importance has been noted of cultural understandings. These exist at a number of levels from societal expectations of education (Lowe, 2007), professional and pedagogical understandings among staff (Cuban, 1993) and, vitally, the culture of the particular school. The ethos of the school affects the way space is engaged with, organised and used (Uline et al., 2009) but, conversely, ‘the physical environment is a visible sign of the school’s culture: tangible evidence of its values, norms and behaviours’ (Briggs, 2001: 176).

In understanding alterations in practices, including why change fails to occur, such ideas about culture are useful.

To consider the detail of how school setting and educational practices fit together, Gislason has proposed a model with four components: staff culture, student culture, ‘organisation’, which is comprised of aspects such as timetabling and curriculum, and ‘ecology’, comprised of physical and technological resources (Gislason, 2010: 129). These ideas resonate with Moos’ earlier model that sees ‘classroom climate’ resulting from interactions of teacher characteristics, student characteristics, ‘organisational factors’ and ‘physical and architectural features’ (Moos, 1979: 161). Although we might question the separation of teacher and student factors, since the school culture
must depend on both, with learning experiences emerging from their interaction, these models make sense in relation to our previous work in this area (Woolner et al., 2007; Woolner et al., 2012b).

Figure 1: Models of school culture by Moos (left) and Gislason (right)

These models can potentially explain some historic examples of occasions when alterations were made to physical learning space but change in educational practices failed to happen: it can be proposed that developing new practices will tend to require changes that may include, but should not be limited to, changing the physical space (Bennett et al., 1980; Cooper, 1981). Such models may also be useful in thinking about altering pedagogical practices to include more team teaching, a change often proposed in connection with more flexible use of space, which has been shown to be difficult to enact (York-Barr et al., 2007; Graue et al., 2007): in this case, the change made is organisational, but what is desired is change in teaching and learning and, arguably, a change in culture. It might be questioned whether the school culture can be altered directly or whether it is an emergent feature that will tend to change as a result of successful change to other aspects. This is suggested by Moos’ model, although not by Gislason’s. Additionally, neither of these models prescribes an order for making changes within their systems and empirical work may be beneficial in this respect.

In this paper, we consider a school where change in teaching and learning practices was actively pursued by the school leaders, primarily through organisational and physical change, but with awareness that for change to be successful staff and student culture, their expectations, intentions and understandings of teaching and learning in this school, would also need to alter. The intention was to move from traditional teaching of separate school subjects by one teacher in an enclosed classroom with classes of 25 to 30 students to a more interdisciplinary, enquiry-based pedagogy facilitated by flexible use of bigger spaces and teams of teachers. One way to encourage and support such change would have been the participation of staff and students in the design process, but this had been limited by the school’s circumstances as a new school, formed by the merger of two schools that had formerly used separate buildings on a shared site. Students from the two schools had been involved in some consultation about the new building but consultation of school staff was severely limited by the fact that the new staff had not then been appointed when the build was at the design stage. Instead the school leaders decided to use the time while the new building was under construction to make organisational changes to support the intended move towards the new teaching and learning practices, which will be detailed below. This was also the time used to attempt to shift staff and student cultures, particularly relating to learning and teaching, which was the point when we became involved.

School Context
The school is a non-selective secondary school of approximately 1000 students, aged 11-16 years. It is located in an area which has lost much traditional employment, producing concerns that
students lose motivation and develop limited aspirations as a result of poor employment prospects. Due to this post-industrial situation the local population is steady or decreasing and the school competes for its intake with a number of other secondary schools. School leaders therefore feel the need to establish the school as distinctive. In considering how to do this while meeting the needs of the students, the head teacher and other senior staff are preoccupied by decreasing achievement within the lower school years that will translate into lower attainment at GCSE in a few years if no changes are made to pedagogical practices. As well as failing these students, such reductions in GCSE results could prove disastrous for the school given the current UK climate of league tables of exam results and the encouragement of parents to choose schools on this basis.

The response of the senior management team was to review the school curriculum, through which they intend to spearhead a transition to learning which emphasises skills and competencies over content knowledge. This change in approach was to be built on organisational change where existing school 'departments' were to be combined into five new 'faculties', bringing together related disciplines such as maths and science, and the development of 'enquiry' based learning. This approach intends students to collaborate with teachers and their peers to develop their own learning. A central aim of the design of the new school building was to facilitate such learning, giving students more autonomy through the provision of shared space in place of traditional classrooms. In addition, in the context of this school, the enquiry approach is intended to pull together previously more disparate subject knowledge and encourage more interdisciplinary working among staff.

**Collaborative research and the Experimental Week**

Senior leaders had planned for the organisational change to the new faculties, and so more interdisciplinary working, to proceed a full year before the move into the new building. During the year before this reorganisation into faculties, it was intended that a transition in practices and pedagogical understanding was to begin. More enquiry based learning would be planned and attempted, specifically in response to an 'experimental week', which took place in the middle of the school year.

This experimental week of enquiry based learning was conducted by teams of teachers with a large group of students (approximately 80 Year 8 pupils, aged 12-13 years) in an existing open space. During the week, teaching staff worked across existing departments within the new faculties, with each faculty having responsibility for arranging enquiry based learning relating to their disciplines for one day of the week. The curriculum was organised around a main theme of a local landmark bridge. The students were chosen by senior teachers in collaboration with form tutors and subject teachers to represent students' full ability range, but the school leaders decided to exclude students whose behaviour might be challenging or difficult. The teachers' involvement was broadly voluntary and discussion with them revealed a range of views. Although some got involved in the experimental week because they were particularly enthusiastic about the new approach, others had considerable misgivings.

We were engaged to facilitate the teachers' reflections on learning and teaching as they prepared for the week and as they considered the experience afterwards. Our research interest centred on the experience of both the teachers and students during the week, and how this related to their understandings of learning and teaching before and afterwards. We have discussed the student perspective elsewhere (Woolner et al., 2012a) and in the present paper will be concentrating on the staff.

The discussions we facilitated within the faculty groups and our conversations with the teachers
were mediated by various items and activities, many visual in nature. The intention was to initiate and facilitate discussion with and between a range of staff representing different disciplines and with varying levels of seniority. Previous work has demonstrated the advantages of visually mediated encounters in encouraging the participation of diverse groups of people, facilitating discussion about unarticulated or implicit experiences and ideas, and building understandings within a group and as part of an iterative process over several sessions (Bragg and Buckingham, 2008; Clark, 2010; Woolner, 2010; Woolner et al., 2010). We will be referring to the staff sessions before and after the week, which formed the core of the teachers’ reflection and collaboration processes. These meetings were intended to involve all the staff who facilitated the enquiry learning during the week, equating to between 4 and 6 teachers from each of the five faculties. One member of the research team was present at meetings before the week with school leaders, and, during the experimental week, two members of the team observed three of the five days with the intention of noting how teaching and learning activities were organised in the space available and how the days were experienced by students and teachers. In addition, we conducted one to one interviews two months after the week with some of the participating teachers and also several of the school leaders, facilitated by photographs of the week taken by a professional photographer who was engaged as part of the project.

At the initial meeting with the teachers, the first activity involved them working in their faculty groups to ‘diamond rank’ (see Clark, 2012; Woolner et al., 2010) nine images of teaching and/or learning according to the extent to which the photographs showed ‘good learning happening’ as opposed to ‘poor learning or less learning’. Within faculty groups, we then focused on developing discussions about the ‘hopes’ and ‘concerns’ of staff regarding the experimental week. During the session with the teachers after the experimental week, we facilitated reflection on their experiences of the week through a range of methods. These included presenting quotes from students for discussion, revisiting the diamond rankings produced during the first session, viewing a continuous slideshow of the photographs taken during the week and asking for their advice to the rest of the school regarding changing pedagogical practices. Approximately a month after this, we returned to the school and conducted the one-to-one interviews mediated by photographs with teacher participants and also members of the leadership team (interview data presented below is taken from three interviews with leaders and four with teachers).

In the following sections, we will present and discuss the understandings and experiences of the school leaders, who initiated the proposed changes, and of a sample of teaching staff who are tasked with enacting them and were involved in the experimental week. This has been achieved through examining the data collected during the various encounters with the leaders and with teachers from two of the five new faculties. This focus enables us to consider a range of viewpoints without an overload of detail that might obscure understanding, although clearly this narrow analysis is informed by our experiences with the wider pool of staff and, indeed, with the students also. In choosing two faculties to examine, we prioritised contrast and have selected a faculty (‘Creation’¹, comprised of ICT and Design and Technology departments, together with business studies) where staff already did some interdisciplinary work and were broadly enthusiastic about developing an enquiry based approach together with a faculty (‘Explanation’, comprised of the existing mathematics and science departments) which brings together a pair of quite separate departments and includes teachers with doubts and concerns about the proposed changes.

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¹ The names given to the two faculties are pseudonyms
Before the Experimental Week

Teaching and Learning Experience
Senior leaders perceived a lack of aspiration and a certain cynicism among their pupils, which they hoped could be addressed through changes to teaching and learning practices. The proposed enquiry based learning was intended to engage students in learning through the types of interdisciplinary problems that people experience in the real world. In essence, senior staff hoped that an enquiry learning approach in a shared space might enable pupils to work more independently, respect each other and give them more self-belief as well as a willingness to take risks and try new things.

Nevertheless, senior leaders were aware that they needed to get staff on board in order for this approach to work. There was a perception that staff would fall into two camps: those that were keen on a new way of working, and those who were unsure. There was a perception of a core group of teachers who were keen, but uncertainty about how many, and whether they would be enough to inspire others. The judgement of the school leaders was that in order to get teachers on board, there was a need to engage in dialogue, and practice the approaches, following a period of teacher development that took into account teachers mental models of teaching and learning yet placed enquiry based learning at the centre of their practice.

Our initial discussions with the teachers suggested that they were open to pedagogical change since they saw the potential of a curriculum that would be more engaging, could foster group work and collaboration, and encourage greater independence amongst students. It was felt that at present students struggled to lead their own learning and take risks. It was hoped that a more relevant, enquiry based learning approach would ultimately raise students’ aspirations and achievement. Whilst there was a general agreement amongst teachers that this new approach had the potential to be transformative and was therefore desirable, there were also a variety of concerns raised.

Some teachers, particularly those in core curriculum areas, had concerns relating to content knowledge, differentiation and adequately preparing students for exams. For these teachers collaborative, cross curricular and student led learning was wholly different to current practices and led to varying degrees of anxiety; in one case a teacher informed the researchers that he had resigned on the basis that he did not want to teach in this way. However, this was not universally felt and for those teachers in subjects that had a history of adopting cross curricular projects, it was simply expressed that ‘we do this already’. All the teachers involved in the experimental week were aware of the need to capture students’ enthusiasm for this new vision and approach and so were keen that the week should be a success in terms of student enjoyment and engagement.

Organisation
Senior leaders were aware of other innovative approaches which had been tried in schools near them, such as a ‘chairless school’ (where pupils worked in bigger learning spaces in larger groups) and the Self Organised Learning Environments (SOLES) being trialled by Sugata Mitra and colleagues [need refs].This, nevertheless, was tempered by the tensions inherent in the rigidity of the curriculum and the time needed to cover content, perceived to take longer through an enquiry learning approach. Their intention was that the reorganisation into faculties, in which subject departments were grouped together, would initiate inter-disciplinary communication and working.

Teachers recognised that this new organisational structure would alter practices, and discussed how cross curricular projects could be the basis for teaching and learning; it was felt that this would
enable students to develop an awareness of learning across subject areas. The teachers expressed the need for strong and supportive leadership and management during the transition years; specific requests included time, resources and a consistent whole school behaviour management policy. Time related particularly to collaborative teacher planning, which would be crucial in making the cross curricular enquiry based projects a success.

**Physical space**

Several practical problems with the new school environment were anticipated by the school leaders linked to the changed way of working. Senior staff felt as if the noise levels might be a problem in a large shared space, and had considered the possibility of giving teachers microphones. Staff would not have their own classroom, or territory that they could make their own and school leaders wondered about possible impacts on professional identity. Shared planning would be needed, and a common language of learning needed to be developed. Shared spaces would entail collective responsibility for keeping them nice.

The teachers also expressed concerns about moving out of traditional classrooms: one commented that at present it can be a challenge to get students to sit in their seats at the beginning of the lesson and asked “without walls how is it going to work?” This was particularly in reference to gathering the whole class together, for example during starters and plenaries. However, it was also felt that the open plan spaces would provide students with more physical freedom under the supervision of staff, which it was hoped would improve student behaviour.

Considering the setting for learning, during the Day 1 discussions, ‘Explanation’ drew attention to a classroom layout that provided ‘opportunity for collaboration’ and commented on the benefits of a ‘different environment’ in referring to images of groups of students outside. The diamond produced by ‘Creation’ included a criticism of a classroom with ‘too much clutter’.

**After the Experimental Week**

**Teaching and Learning Experience**

In both the faculties whose Day 2 discussions were analysed there was a strong element of positivity running through their comments, both in terms of facilitating enquiry learning and the teachers’ impressions of the student experience. Mostly the teachers (and also the senior leaders) felt that students had enjoyed the week, had engaged very well with learning through methods such as group work and guided research, and had in general learnt something.

> The groups of pupils all looked engaged in learning, they all looked like they were enjoying themselves and were not self-conscious. (L., ICT teacher)

> The kids seemed to get a lot out of it….. (J., maths teacher)

> Once they go into the building part, they were very engaged and some of them asked if they could stay over dinner-time. (A., science teacher)

Comments relating to students mentioned movement quite frequently, often linked to ideas of independence, but there were also some comments voicing concerns about certain students who might not benefit from the style of learning, in particular SEN students. There was a brief discussion about some students and some learning requiring the opportunity for private study. This worry about students being fundamentally unsuited to this way of working was of more concern among the ‘Explanation’ teachers, whereas the ‘Creation’ teachers discussed the challenges of
engaging certain ‘characters’ and leaving them no time to misbehave.

Figure 2: Students engaged on enquiry learning days organised by ‘Explantion’ (left) and ‘Creation’ (right) Photos: Keith Pattison

Some of the maths teachers within the ‘Explantation’ faculty also felt that their subject was unsuited to this way of working: ‘maths is different’ was a comment made. Relating enquiry-based learning to the curriculum was also noted as a concern by one maths teacher who told us:

….. of lessons that week, for me personally I missed five Year 8 classes and the content that was in that day didn’t even touch what would have been a normal week. So that would be a concern for me. At the end of the day they’ve still got to get through everything that’s in the curriculum. (J., maths teacher)

This teacher went on to say:

I asked them [Year 8s] if they felt that had done as much work in the week as they would have normally and they said ‘no way!’. (J., maths teacher)

This view was supported by a science teacher:

There may be times when content can’t be taught like this [EBL], it’s a case of these are the facts we’ve got to learn. At the end of the day in Year 11 they’ve got an exam they have to be able to complete and feel confident that they will do well. (A., science teacher).

The senior leaders acknowledged these concerns, but felt that there was ‘a place for everyone’ with this style of learning. They referred to the previous experiences of these students in local primary schools, where much of the work is project based and cross-curricular, indicating that this is a style of working that students are already familiar with. Nonetheless, they realised that some children work better alone, or with a book, or are not as keen on particular subjects. This was particularly an issue when certain subjects were to be, in effect, taught for a whole day rather than short blocks of time. On balance, senior leaders felt that the structure of the new way of working allowed for flexibility, and enabled pupils to work in the ways which suited them. Although the senior leadership felt that there was a risk of people perceiving that the children had not learnt as much as they would have done in traditional lessons, they valued the ‘deep learning’ that they felt was going on:

There is undoubtedly a time when there is content that has to be covered, but I think that
often, with core subjects that are very concerned about their content coverage, they’re [pupils] taught it, but I’m not sure how much it would have been learnt and absorbed, whereas if you take the time to learn how to learn and the time to learn how to think, then that’s deep learning that’s then understood when you need it… that then stays with you better and can be applied better in different circumstances as well. (School leader)

The senior leaders also commented that the traditional roles of teacher and pupil had been challenged during the week. They felt that it was a benefit that teachers and students were seen in genuine collaboration, and that students were enabled to ‘be the expert’ in their own learning, rather than the teacher, who became a co-investigator or facilitator of learning.

In relation to both their own and the students’ experiences, the teachers commented on the week being tiring and many of the comments referred to how busy or hectic their day of teaching had been:

*It worked quite well, but I found it quite tiring, and I found as well that at break, instead of us getting a break as well, we found ourselves clearing and preparing for the next one.* (J., maths teacher)

There was a general feeling that enquiry learning was very much a ‘novelty’ and that enthusiasm and interest would wain if it was done all the time:

*The day has helped a little bit but I think the novelty of what was happening kept them interested, I’d like to see what would happen after a few weeks of doing that, but on that day they did really, really well.* (A., science teacher)

*On a week to week basis I don’t think we could keep that momentum going. But elements within it we could.* (L., ICT teacher)

In many case these comments about time and effort linked to a recurring concern, that of planning, which will be discussed in more detail below.

**Organisation**

Many of the teachers’ comments during the Day 2 session related to the organisational challenges of facilitating this approach to learning. These ranged from immediate practical aspects, such as preparing enough material to keep students occupied, through discussions of arrangements for facilitating group work, to some discussions of issues arising from working across traditional subject boundaries. The experimental week had enabled the teachers to develop their appreciation of these aspects, including noting the ability of the students to adapt to group working situations as the week progressed, but this left them all similarly certain of the time required to plan such learning initially. There was evidence of a slightly more positive reaction to this conviction in ‘Creation’ where staff reported that they had used the faculty budget to go away for a planning weekend and had time arranged the following week to plan as a faculty for the following year’s Year 7 students. Within ‘Explanation’, the comments centred on the time required to plan effectively and suggested a note of panic about how this would be possible: ‘Three hours planning were not enough for one day…and we need to plan a whole year’.

In both faculties, the challenges of interdisciplinary working were mentioned. However, while the ‘Explanation’ teachers felt that they had struggled on the day to link maths and science, making merely ‘tenuous links’, the ‘Creation’ teachers’ concerns were with how the teaching of particular
skills could be harmonised across the whole school. This demonstration of more doubt about working between faculties than within their own faculty is presumably related to their existing practices, which they considered to be quite interdisciplinary, and which tended to involve collaboration with other staff such as technicians.

It was notable that an underlying feature of all the conversation about organisation was planning. Again and again, the teachers' discussions returned to the issue of finding time to plan:

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\text{The key aspect was time, to sit down as a group and think how are we going to work this – what key concepts of the curriculum are we trying to hit? That's going to be the biggest challenge for setting it up if this is something that's going to happen all the time – it's finding the time for planning. (A., science teacher)}
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The two problems identified were that more time would be needed to plan for the new approach initially because it was new, but also that for genuine collaborative planning to occur there had to be opportunities for colleagues to get together and plan.

![Figure 3: Response sheet for teachers’ Day 2](image)

When we asked the teachers to summarise their learning from the experimental week (see response sheet above), planning featured frequently in each section of the table and was offered as the essential ‘action’ by both faculties:

- Joint planning time
- Progress centre needs to be involved in planning
- SLT need to make time available

The response from 'Creation' was particularly striking with the learning features of detailed planning, pacing and lots of activities narrowing to planning and a ‘wide range of activities’ needing to be passed on to the wider school, but then reduced to just one action: that of senior leaders making time available for joint, collaborative planning.

**Physical space**

Little of the teachers' discussions on Day 2 focused on the use of space, even though the experimental week had been explicitly about working in a different space and the teachers were all very aware of the layout of the new building being built. Even when the new school premises were mentioned, the tendency of the teachers was to focus on the challenges of interdisciplinary enquiry learning and collaborative teaching rather than on the space itself:
When the new building comes in, this is going to be how a week will be – they will have half a day with Explanation, half a day with others. So this is what they will do. This is completely different from anything I’ve done before. (J., maths teacher)

Comments about student movement made implicit references to the space, since this much movement would not be possible in a traditional classroom, but the teachers did not discuss their facilitation of this aspect of the learning. Our observations during the week suggested that the ‘Explanation’ faculty had quite consciously tried to mirror the layout of the new school: they arranged and rearranged furniture within the hall during their day to facilitate a number of different groupings for different activities, moving from a whole group introduction, through four class-sized groupings to smaller groups scattered through the hall (see figure 4 for the class-sized grouping). The teachers in the other faculties tended to use a mixture of presenting to the whole group of students or small groups distributed in an ad hoc way around the hall. The ‘Creation’ faculty reported that they felt limited by the space available because it did not contain the ICT and other resources they would need to cover their curriculum area properly. They also commented in response to the slideshow of photographs from the week that bigger desks were necessary.

Figure 4: ‘Explanation’ teachers explicitly attempt to organise space to mirror new building

Since noise is frequently cited as a problem in open plan learning space, we specifically sought the teachers’ views on this aspect of the experimental week through presenting a quotation from a student that ‘noise goes high…’. Teachers from the ‘Explanation’ faculty felt that noise had been a problem and that students may have been distracted. Later in the discussion they also expressed concerns that distraction might be a particular problem in the open plan space of the new school for older students working towards public exams. However, it was also mentioned that the new building included ‘sound booths’, which they felt should help with problems of noise being distracting. In contrast, the ‘Creation’ teachers reported that noise had not been a problem on their day, commenting that they ‘didn’t notice the noise as much as when we’re in the classroom’, reflecting again the nature of the subject matter of their curriculum, as well as perhaps their cultural expectations. Thus for both faculties, the design of the new building was anticipated to solve problems relating to noise, even if, for ‘Explanation’, these problems were themselves created by the layout and intended usage.

Overall, despite limited discussion of the use of space during the experimental week, the teachers’ conversations did reveal aspects of their attitudes towards the new building’s design. For the ‘Creation’ teachers, this was generally part of their anticipation and looking forward, actively
preparing for the new building. For example, in a discussion of timetabling problems it was suggested that these ‘should get better in the new building’. The ‘Explanation’ teachers also mentioned the new building, but for them the important aspect seemed to be the ability of the design to ameliorate some of the problems of enquiry or collaborative teaching and learning. Senior leaders commented that they felt the experimental week had had an impact on preparations for the new school, but their perceptions were similarly not focused on the physical environment of the new building:

*This week has accelerated that process of discussion and I think some teachers are excited by it, and some are hiding under their duvet.* (School leader)

**Concluding thoughts**

This paper has presented the experiences and views of two faculty groups of secondary school teachers in relation to a school decision to change pedagogical practices. Their perspectives on teaching and learning, in their current setting, during the experimental week of enquiry learning and as anticipated in a new environment, have been considered in light of the school context and the intentions of the school leaders initiating this change. The elements of an educational learning environment that have been previously identified as important – that is pedagogical intentions and practices, organisational aspects, and the nature of the space itself – have indeed structured the understandings being developed in this school. We were also interested in the culture of learning in the school, since culture is important in circumstances of change and, in this case, the senior leaders were aware of a need to effect cultural change within staff and students in order to support the pedagogical change they wanted to see enacted. To conclude this paper, we will consider these issues by summarising what appeared to be happening in this school, how this relates to other reported experiences and previous research, and the implications of this for understanding and modelling change.

**Change in education**

It has been argued that educational establishments are inherently conservative due to their role in transmitting knowledge and culture from generation to generation (Young & Muller, 2010:15). Certainly, in this school, many of the concerns about changing practices expressed by the teachers related to wider, societal requirements of the educational system in the UK, such as conveying core curriculum knowledge and preparing students for exams. Another strand of concerns, however, were more particular to this school, relating to organisational problems, such as planning time, and working effectively across the school to produce a coherent learning experience. Thus, the variety of concerns, and the differing types and levels of action needed to address them, suggests the challenge of pursuing change in educational practices.

The complexity of educational settings that this points to has been discussed by researchers investigating the implementation of a class size reduction policy in the US who note that even a clearly defined objective is not ‘a single policy variable but a cog in the larger machine of schooling’ (Graue et al. 2007: 696). In describing his conception of ‘classroom climate’, Moos is careful to draw attention to this complexity, by proposing that, despite the depiction of single directions of influence between factors, he conceives of causal affects happening in all directions. Also, it is interesting to note that some of Moos’ examples of influence relate to the selection of students and teachers to particular settings or styles of organisation as well as to the possibility of the behaviour of teachers and students being affected by physical or organisational features. In the case of the school we researched, there is the suggestion of change in pedagogy and culture eventually being enacted through a mixture of these processes: some teachers intended to change their practices, but others were intending to leave, presumably to be replaced by teachers who preferred enquiry
learning and collaborative use of educational space.

**Challenges**

As mentioned in the introduction to this paper, there is a body of research concerning the difficulties of implementing team teaching and the challenges of the related issue of teaching and learning in open plan educational space. However, it is important to note that there are also published studies of schools where change to cross-curricular, student-centred learning supported by flexible space and staffing has been successful (e.g. Gislason, 2010; Briggs, 2001: 184-6).

The responses from the teachers in our case study clearly show that many of them are already struggling with collaborative teaching, and all were concerned about managing joint planning. Some were additionally raising concerns around whole school coordination. Recent US research considering team teaching would suggest that the teachers’ anxiety was appropriate. York-Barr and colleagues warn against supposing that moving to collaborative teaching is a ‘relatively straight-forward…structural change’ (York-Barr et al., 2007:331), while the class size reduction researchers comment that it is ‘erroneous to throw two teachers together and expect them to work in tandem’ (Graue et al., 2007: 696). Both teams of researchers recommend specific training and professional development together with time allocated for collaborative planning.

As discussed above, the use of space was not yet an issue for these teachers, with the experimental week treated as a ‘novelty’ in spatial terms, though arguably seen as more of a dry run in terms of pedagogy and interdisciplinary collaboration. One teacher we spoke to queried the plan for the organisational change (in timetabling and from departments to faculties) to precede the change in physical space. Although this plan seems sensible in terms of recognising that changes to physical settings do not by themselves change pedagogical practices, it does raise the question of whether the logic of the planned changes were being adequately explained to the teaching staff. In the case study school studied by Briggs, which appears to have similar values regarding learning to our research school, changes to the timetable were also made first, followed by physical change to accommodate the new pedagogy. However, change seems to have taken place over a longer period (5 to 6 years) than is intended in the school we studied, and to have happened more organically. Notably, the innovative approach to learning only takes place one day per week.

**Effecting cultural change in school**

We began this paper by recognising the contribution of cultural understandings to the use of educational space and the pedagogical practices adopted. However, we also noted that despite awareness of this issue, there was less clarity in how a school culture develops: how does it emerge from, but also define, the local ‘ways of doing things’ produced by the confluence of practices, organisation and space?

In this school, the coming changes to the physical setting are intended to support the desired pedagogical and cultural changes. New organisation, in the form of faculties and block timetabling, that coheres with the desired use of the space will be put in place first, followed by the physical changes, with the combination intended to embed pedagogical change. The model of these elements that underpins our understanding of the situation for this school is shown in figure 5, with the three key aspects of the school approach on the outside, where they can be subject to direct change, and school culture inside produced by and influencing the other elements but not available for direct alteration.
As Gislason has argued (2010; 2011), when cultural, organisational and spatial elements are mutually supportive, the school’s educational approach will tend to endure and develop, rather than slipping into some uncomfortable accommodation of conflicting elements. The question for this school is whether they have begun to progress towards a coherent, balanced situation. The changed organisation and physical space will be open to observation over the coming years of change and it will be possible to check if they are supportive of the enquiry learning envisaged by the school leadership. Pedagogical practices within the school can also be examined and compared with the aims of the school, though these might need clearer articulation.

What is much more difficult to assess is the cultural aspects, although it seems likely that they will indeed be central to the success of the proposed change. It was evident from discussions and interviews that the teachers did to some extent share the values relating to enquiry learning as envisaged by the school leaders. It seems, however, that this could show adherence to a general ‘idealised practice’, which values student autonomy over teacher-directed learning, rather than a sharing of particular cultural and pedagogical values within the school. Furthermore, the concerns expressed by some of the teachers about school level coordination and organisation suggest that there are other problems with shared understandings across the school. The leaders wanted the teachers to engage with and practice the new approaches, while the teachers looked to the leadership team to make time and space available for the many different pieces of collaborative planning required. There are hints here of fragmentation within the culture of the school which seem likely to make the substantial pedagogical change the school is planning more difficult to enact successfully.

References