Northumbria Research Link

Pictures are necessary but not sufficient: using a range of visual methods to engage users about school design

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Abstract

It has been argued by both educationalists and social researchers that visual methods are a particularly appropriate to the investigation of people's experiences of the school environment. The current and expected building work taking place in British schools provides an opportunity for exploration of methods, as well as a need to establish ways to achieve this involvement of a range of school users, including students.

This article describes a consultation that was undertaken in a UK secondary school as part of a participatory design process centred on the rebuilding of the school. A range of visual methods, based on photographs and maps, was used to investigate the views of a diverse sample of school users, including students, teachers, technical and support staff and the wider community. Reported here is the experience of using these tools, considering the success of different visually-based methods in engaging a broad cross section of the school community and revealing useful information.

It is concluded that such methods allow a complex, but coherent, understanding of the particular school environment to be constructed and developed. It is further argued that such a range of visual and spatial methods is needed to develop appropriate understanding. The study, therefore, contributes to knowledge about specific visual research methods, appreciation of the relationship between tools and so to general methodological understanding of visual methods' utility for developing understanding of the learning environment.

Introduction

The role of participation in the process of understanding the learning environment

If the learning environment is understood as resulting from a complex interacting network of social, cultural, organisational and physical aspects (Moos 1979), then the part played by the physical setting is far from straightforward. Attempts to assess the impact of physical characteristics of schools and classrooms in isolation tend to lead to confusing and, often, contradictory, conclusions (Woolner et al. 2007a), yet it seems clear that the physical setting must have some effect on the learning that occurs there. Although the surroundings do not

determine the teaching and learning which takes place, they can clearly help or hinder particular approaches (Horne-Martin 2002; see e.g Rivlin and Rothenberg 1976; Bennett et al. 1980 for the effect of open plan settings on teaching). Research shows that both teachers and learners notice the physical environment and develop opinions about it (Cohen and Trostle 1990; Maxwell 2000; Burke and Grosvenor 2003), which will influence their attitudes and views to the learning experience as a whole. This presumably affects behaviour in school (Kumar et al. 2008; Rudd et al. 2008), leads to impacts on the morale of students and staff (Hallam 1996), and may influence attendance levels (Durán-Narucki 2008). It has been argued these could be routes by which the physical environment could ultimately produce changes in students' academic achievement (Weinstein 1979), contributing to the association that has been found between a neglected or deficient physical environment and achievement (Woolner et al. 2007a).

Within schools, therefore, the construct of physical environment, narrowly understood as the actual physical setting, is enmeshed within a complex network of organisational and behavioural factors, all contributing to the learning environment as experienced by the students and impacting on their success. It should be possible to enhance this overall environment through improving the physical environment, but to do this it will be necessary to understand the relationship of the physical setting to the other aspects of the learning environment. In addition to investigating the school building itself, we need to enquire about how the premises are used, what happens where, and how this is understood by the users.

If student attitudes and opinions are proposed as a vital link between the environment and their learning experience, then it seems important to consider them. Such reasoning has contributed to recent interest in 'student voice' (Clark 2004), some of which has been directly linked to the physical setting (Flutter 2006). Within research into the learning environment, this logic is also evident. For example, Könings et al. (2007) clearly articulate this idea, noting that 'student perceptions of a learning environment determine their learning behaviour' (p.445) and arguing that 'participatory design could help' by giving 'students' perceptions a clear position in the design process of a learning environment' (p.446). It seems unlikely, however, that every effect of the physical setting is mediated by learners' perceptions and opinions. There is some evidence of a direct influence of school condition on the quality of teaching (Estyn 2007) and environmental psychology has found evidence of problems with physical environments, with implications for learning, which users are not properly aware of (Evans and Stecker 2004). In general, the design of a school will affect many organisational, management and teaching decisions, producing a multi-faceted learning environment, with complex patterns of use, within which each user will be aware of differing aspects. Thus, if the environment provided by the school for learning is to be comprehensively understood, it seems important for all those involved, including parents, learning support and other staff, as well as students and teachers, to participate in any investigation. Once this is accepted it becomes necessary to develop research methods to facilitate the genuine participation of a range of users, who will have differing skills and confidence, but need to contribute their knowledge and experience to an overall understanding.

Visual methods within participatory social research

Despite the importance of visual forms of representation to many aspects of our lives, a number of social scientists have commented on the relative under-use of visual methods in social research (Prosser 1998). As Banks (2001) points out, it is possible to overstate this case, but 'Euro-American… societies are also strongly in the thrall of language' (Banks 2001, p.8) and the academic world of research, in particular, can be seen as 'a sea of words and more words, in which visually based communications are not taken as serious intellectual products' (Collier 2001, p.59).

Furthermore, there are some problems even where visual methods are used. Banks argues that the difficulty is not in using images, but in knowing how to use them, leading to instances of insight without methodological understanding. A related criticism, made by both Banks and the sociologist Douglas Harper, is that visual methods can become 'an end in themselves' (Banks 2001, p.178; Harper 2002, p.20), producing observations 'that beg for greater theoretical and substantive significance' (Harper 2002, p.19). In the present context of using visual methods to try to understand and improve the learning environment this aim of going beyond isolated observations or descriptions is pertinent.

It is vital to grapple with these issues because the choices we make about research tools inevitably affect that research since 'a tool is also a mode of language, for it says something to those that understand it, about the operations of use and their consequences' (Dewey 1938). These tools 'frame practice and thus practice develops as new tools and technologies facilitate or enforce change' (Baumfield et al. 2007, p.4; Hickman, 1990). The relative ease, with current digital photographic technology, of putting together a set of photographs for photo elicitation means that it is more important than ever to develop methodological understanding of this and other visual research tools if they are to be useful in furthering understanding of the school environment and the learning and teaching opportunities it affords.

Visual methods within education research

Research into education can be seen as constrained by a reliance on language common to much, if not all, social research, as discussed above. In addition, it can be argued that many practices of education, such as communicating understanding and providing explanations, particularly favour verbal understanding and have led to a certain dominance of language within education. This can be seen in much educational theorising, from Piaget's insistence that a solution to a cognitive task must be properly explained to count as success (Inhelder & Piaget 1958) to recent concerns that learners develop the 'vocabularies' of science and mathematics (e.g. DfEE 2001, section 5). Within learning environments research the investigation of learners' perceptions also tends to rely on verbal skills and articulacy, and may prioritise certain aspects. Methods which make more use of visual and spatial material may widen participation to include all users, and be particularly appropriate to examining the contribution of the physical setting to the learning environment (Lodge 2007; Prosser 2007).

This is of general interest to educators, but is particularly pressing in the UK context since the British government is committed to increasing dramatically the spending on school-building through its *Building Schools for the Future* (BSF) programme (http://www.bsf.gov.uk). Commentators have raised concerns that this programme might fail to deliver significant benefits (Heppell *et al*. 2004) and a study by the Commission for the Built Environment (CABE) concluded in 2006 that half the new schools built by then were 'mediocre' or 'poor' (CABE 2006).

A potential solution to the problem of inadequate or unsuitable buildings is greater involvement of users in the design process (e.g. Dudek 2000). Although attempting involvement is not without its own difficulties (see Blundell Jones et al. 2005, esp. Richardson and Connelly 2005), the participation of users in the design process is recommended by many in the field of school architecture (e.g. Curtis 2003, p.27) and the BSF process involves the consultation of users (DfES 2002, p.63).

Prosser argues that visual methods are particularly useful for facilitating such user involvement, and should allow this to move beyond narrow consultation: 'Emancipatory and participatory research such as photo voice and photo elicitation can gather valuable input from teachers, pupils and others who actually inhabit the built environment' (2007, p.16). Burke (2007) proposes that the power of visual means of expression to allow children to

convey ideas about schools has been demonstrated through the *School I'd Like* project (Burke and Grosvenor 2003) and deserves to be more widely exploited.

Researchers and others working in this area do in fact make use of a wide range of tools and activities, many of them visually based, in their efforts to involve students and teachers in discussion about the learning environment (Harnell-Young and Fisher 2007; Clark 2005; Koralek and Mitchell 2005). Clark has developed a 'Mosaic' approach to researching the views of very young children (aged 3-4), which includes children's photography, map-making and child-led tours of the environment. Clark argues that the range of activities with the children is necessary to capture the 'complexity of their everyday lives' (2005, p.10). Furthermore, the visual and physical basis of the methods focus on 'young children's strengths – their local knowledge, their attention to detail, and their visual as well as verbal communication skills' (p.10). Although the interest here is in young children, this description of the participants' knowledge could equally apply to any user of the school environment.

The activities used in practice with students and others in this context are often pragmatically chosen, however, because they have previously worked with similar participants. Detailed reflection on the individual methods is less frequently attempted and there is little comparison between different techniques. Specifically, it might be questioned whether certain methods are more appropriate for particular groups of participants and whether there is benefit in using a range of methods over attempting to identify one especially successful method. It is in these respects that the present study aims to be revealing.

Aims of this study

The central objective of this study was to explore the views of a diverse sample of individuals from a school community and so develop understanding of the learning environment. Using visual research methods, we explored their experiences of the existing school environment together with aspirations for the future, when the school would be rebuilt. The research would provide the school with information about aspects of the school which should be preserved in the new school and about problems and concerns which the architects could attempt to address. It was intended that the methods chosen would enable the equal, inclusive, participation of teachers, students, support staff and community members. The quality and extent to which each data collection method succeeded in capturing the required insights and how far different methods gather discrete or overlapping data can be judged.

It was anticipated, therefore, that the use of visually based methods in this project would fulfil a number of needs. Firstly, the research methods needed to be appropriate and useful for investigating the varied experiences of this learning environment, adding to relevant knowledge about how schools are currently used. Following the arguments above for the potential of visual methods, this seems appropriate, but it was anticipated that this study would develop understanding of how visual methods might aid this process of investigating the learning environment from a broadly physical perspective.

Secondly, it was important that the methods facilitated the participation of the range of school users, helping the various users to communicate their experiences and opinions, and resulting in an emerging understanding of the learning environment, evidenced by improved immediate shared understanding and material that could be used with architects. Banks describes studies 'that see visual research as an actively, and perhaps inherently, collaborative project' (2001, p.112) so it would seem a sensible ambition to use visual methods, in this way, in the case of school design, to complete 'a project that simultaneously provides information for the investigator while fulfilling a good for the subjects' (Banks 2001, p.122).

Finally, this study enabled a number of visual methods to be used and evaluated in the context of gathering ideas from a wide range of people of differing ages with various relationships to

the school. Considering how these methods worked in practice and the results they produced should illuminate some of the methodological issues of using specific visual methods. This, as has been discussed above, is of concern to reflective practitioners of these methods.

It was anticipated, then, that this study would not merely be an end in itself, but would be a means of developing these three important aims.

Method

Tools used

In psychological terms the representational form seen as contrasting with the verbal is visual-spatial (e.g. Hunt 1994). It was intended that the tools used would tap this wider understanding of visual, non-verbal meaning, so some activities were photograph-based (more visual) and some were map-based (more spatial). Each group of participants took part in one photograph and one map based activity.

Photo elicitation

Across the social sciences, photo elicitation has been quite widely practised and is perhaps better understood than other visual methods. Photographs have been found to be successful in eliciting a wide range of differing ideas from different participants, including information that would be difficult to produce otherwise (Harper 2002). They are recognised as working well to mediate between researcher and participant, 'bridging gaps between the worlds of the researcher and the researched' (Harper 2002, p.20), and providing a focus for all parties so that 'awkward silences can be covered' (Banks 2001, p.68).

In this project, photographs were used in two differing contexts: eliciting opinions and ideas through fairly open observation and discussion, and in a more directed activity, *diamond ranking*, described below. The photographs were taken by a researcher during an initial visit to the school, during a tour provided by the head teacher. The content was guided by his comments, the aim of providing a representative sample of images of the schools and through appreciation of which aspects of schools have generated discussion in previous surveys and research (Cohen and Trostle 1990; Ornstein 1997; Maxwell 2000; Burke and Grosvenor 2003). Although there can be problems with creating images in this manner (see Prosser 1998), it is felt that this background knowledge of the researchers coupled with their having no particular agenda for the consultation in this school, provides a good basis for the production of images which facilitate a genuine participatory process. The success of this can be judged from the results that follow.

Picture sorting involved the participants, working as a group, discussing the set of 15 laminated colour pictures. This group-discussion centred on places that were particularly liked or disliked, reasons for this and derived ideas for the new build. Notes were kept of comments that participants made that were not recorded elsewhere. Participants were also encouraged to write comments on a *giant photograph*, an exterior view of the existing building (see figure 1).

Figure 1: Students adding comments to the giant photograph

Diamond ranking

This is a recognised thinking skills tool, usually carried out with written statements (Rockett and Percival 2002, p.99). The activity involved a subset of nine of the photographs, reproduced on two sheets of A4 paper in black and white. Participants, working in pairs or threesomes, cut out these pictures and stuck them onto a piece of A3 paper in a diamond shape, ranking them by position so that the preferred picture is at the top and the most disliked one at the bottom (see figure 2). They were encouraged to annotate their diamond with comments and explanations.

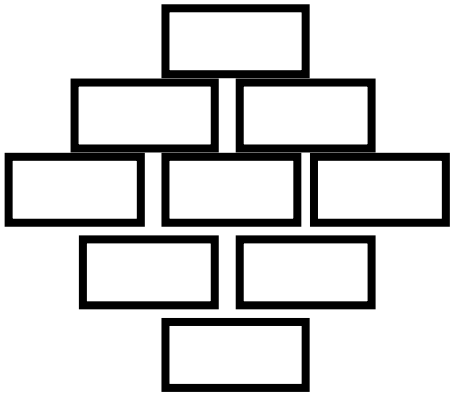

Figure 2: Organisation of *diamond ranking*

Map-based activities

Long term advocate of child participation, Roger Hart, has often argued that map-making can be an effective way for children to communicate their understanding of their environment (e.g. Hart 1979). In the present study the use of maps seemed likely to be a good way to investigate the relationship that all the participants had with the school. There were two mapping activities based on photocopied plans of the school premises. One activity (a) involved each person mapping their location during a typical day, adding stickers (yellow for 'places I like' and red for 'places I don't like'), plus any other comments or annotations. The

other map activity (b) involved each person or pair of participants annotating maps to show 'places that work' and 'places that don't work', using coloured pens, to shade in or circle big areas, and stickers to pinpoint spots (green and blue; green for places that do work).

The consultation context

The school

The school involved in this study is an 11-16 secondary school in the north east of England. When the research was carried out there were approximately 1100 students, 62 teaching staff, 40 support staff and a number of cleaners and lunchtime supervisors. The existing building was built in 1965 and extended in 1973. It is a CLASP construction, a system of building with standardised parts, developed by a consortium of Local Education Authorities in the 1960s, and designed around the need to withstand the mining subsidence which is common in the counties involved. Such schools are of a relatively light construction and were not intended to have particularly long lives. For this reason the school has begun to look somewhat tired and shabby, despite recent maintenance work on the exterior panels and interior painting. It is currently intended that the school be completely rebuilt, probably over the period 2009 to 2010/11.

The consultation

Before the consultation days, the school was visited by a researcher who interviewed the head teacher and was given a guided tour of the existing premises. The head teacher was keen that the consultation should involve as wide a range of participants as possible and undertook to arrange this.

Over two consecutive days, the team of five researchers worked with a total of 38 teachers, 28 support staff and 107 students. Although the participants were not randomly chosen but were asked by the head teacher to attend, based mainly on their availability, there was no sense that this was a skewed sample. The teachers represented a variety of subject areas and ranged in seniority from newly qualified to Assistant Head. The support staff had been chosen to represent as many job categories as possible and included Special Educational Needs learning supporters, teaching assistants, administrative staff, technicians, lunchtime supervisors, cleaners, the caretaker and the groundsman. Although parents and other members of the local community might appear not to have been included, a number of the staff lived locally and often spoke from the perspective of a parent, resident or community-user of the school facilities. All the year groups (Y7-Y11) were represented among the students, who were fairly equally split between the two genders, and because whole classes were generally provided it seems unlikely that particular types of student were being excluded or included.

The consultation activities took place in the library/learning resource centre. Any school user who had not been directly involved was invited to come during lunch breaks to make comments to the team, an offer that several staff responded to. The participants worked in groups which were broadly homogenous, consisting of, for example, administrative staff; cleaning staff; Design and Technology teaching staff; senior managers; a group of Year 7 pupils. This was done to reduce time spent addressing assumptions and background knowledge, but also to reduce any reluctance to discuss issues of school organisation in the presence of more powerful individuals.

On the first day, participants worked on the mapping and photograph-based exercises described above. The second day followed from analysis of the data produced on the first day, structured around key themes, and a selection of statements was used, taken from comments made during the first day's activities. Both negative and positive statements were included as it was considered constructive to highlight successful aspects of the current premises and

avoid simply listing problems. It was intended both to check the validity of the views expressed and to link developing ideas to the discussions of the previous day.

This article will focus on the use of the visual methods on the first day and, specifically, the success of these methods in producing the information required to carry out the second day's consultation and produce a report which the school can use as the design process progresses.

Results

Photo elicitation: picture sorting and the giant photograph

The *Picture sorting* activity worked well for a number of reasons. The inclusive approach meant that various stakeholders were offered an opportunity to voice their opinions, and the range of staff and ages of pupils meant that various perspectives were explored. Cleaning staff reported that they were particularly pleased that they were included in the consultation – this was unusual they said - and their involvement had the benefit in that they were also local residents and parents of pupils. These additional perspectives were apparent in their discussions.

The reliance of this exercise on visual stimuli and verbal responses, worked well with the different groups, and, where levels of literacy may vary, such as with the younger children. The photographs were useful in stimulating discussion, although some groups were initially more reluctant to talk. Respondents tended to focus on images that closely represented their particular 'areas' or classrooms they were familiar with; they would pick up the photographs, sort and sift through them, and talk about the issues related to the image.

The administrative staff, for example, focused on the photograph which depicted the school reception area and spoke of the difficulties of crowding and access, whilst the cleaning staff considered many photographs but offered a unique perspective on the practical aspects of almost all of the areas, such as the type of flooring and the weaknesses of particular furniture. Teachers focused on particular classrooms they used, and pupils considered the images that depicted communal areas such as the toilets, dining room and corridors.

Comments were made about specific design aspects, such as the physical inadequacies of the student toilets, but the photographs also prompted reflections about related organisational issues. For example, comments about an ICT room included problems with the size of the space and the organisation of learning (e.g. "flexibility is difficult"). It was revealing when places were discussed in a number of groups. For example, members of the administrative staff who had worked in the school for over 25 years recalled a time when the school garden was used differently through being accessible to all. This contrasted sharply with younger pupils who had never known the garden as an accessible area. Although in both cases, the picture prompted comments about access arrangements, the different users were able to offer subtly different perspectives on the issue, so providing a more complete understanding.

As this suggests, it was entirely possible for the same picture to suggest to different people different ideas, associations and indeed opinions about the school. Despite being of particular, identifiable places, the photographs seemed to successfully avoid being prescriptive and, instead, allow space for individual reaction. So, for example, Picture 10 (see figure 3), provoked comments about narrow corridors, including discussions by teachers of transitions between lessons, revealed that the younger children felt "over-whelmed" at these times and prompted some students to talk about improving signage and theming corridors around curriculum areas. Similarly, Picture 11 (see figure 3) provoked comments which ranged from the need for daylight, and the use of blinds, through complaints about window opening and temperature control in the school, to discussion of children climbing on the roof.

Figure 3: Pictures 10 (left) and 11 elicited a wide range of responses

The photograph of the exterior view of the school, which was used in the picture sorting activity and as a giant photograph to be annotated, was especially successful in eliciting more general comments about the school, including suggestions and aspirations. Being shown the school from the outside suggested certain issues and many of the comments written on the picture, and those made in response to this photograph during the sorting activity, centre on general appearance. Comments during picture sorting included "shabby, not colourful" and there are several mentions of the need for "better colours" written on the enlarged photograph. During the picture sorting, this photograph prompted some Year 7 students to move from discussing rubbish and the big fences to mention that they felt ashamed of the school, considering it had a bad reputation. This was not a common attitude among students or staff, but it is notable that it was the external 'view from the neighbourhood' that produced such concerns.

The photograph also prompted comments about outside space, which tie in with the results of the other activities. A number of students wrote suggestions for improving the outside space (e.g. "seats outside so we can have lunch") onto the enlarged photograph, and one group of teachers responded to this photograph by discussing the need for space for children to play. They saw this as part of the issue of behaviour in school, and notably some of the students responded to the giant photograph by marking smoking spots and places where "people climb over the fence", together with suggestions for places to have CCTV cameras.

Finally, perhaps partly because the photograph featured a sunny day, there were several comments written about temperature ("should have air conditioning"; "science block always boiling"). Similar comments were made during the mapping and *diamond ranking* exercises, however, so it seems reasonable to conclude that this is a general experience. This is relevant given the links suggested by previous research between physical discomfort, relating to temperature and air quality, and student behaviour and learning (Woolner et al 2007a, p.50-52).

Diamond ranking activity

Like the picture sorting, the *diamond ranking* activity succeeded in eliciting preferences for particular parts of the school, but it also forced participants to quantify their preferences and allowed the collection of background reasons, through annotations to the constructed diamond (see figure 4, below). These comments often demonstrate that the pictures were prompting reactions to quite generalised ideas about the school, including aspects of construction, organisation and learning. For example, comments were added such as "unwelcoming" and "claustrophobic", but also "modern" and "good fast computers". In the diamond reproduced

below, two quite different rooms are bracketed together with the annotation “learn but have fun”.

Figure 4: Diamond ranking

The structure of this activity allowed a more quantitative approach to be taken to analysis of the results, complementing the more qualitative approach taken to the responses to the picture sorting activity. In the report presented to the school, the following diagram (figure 5) was used to show how the pictures had been ranked, then the reaction to each picture was discussed in detail.

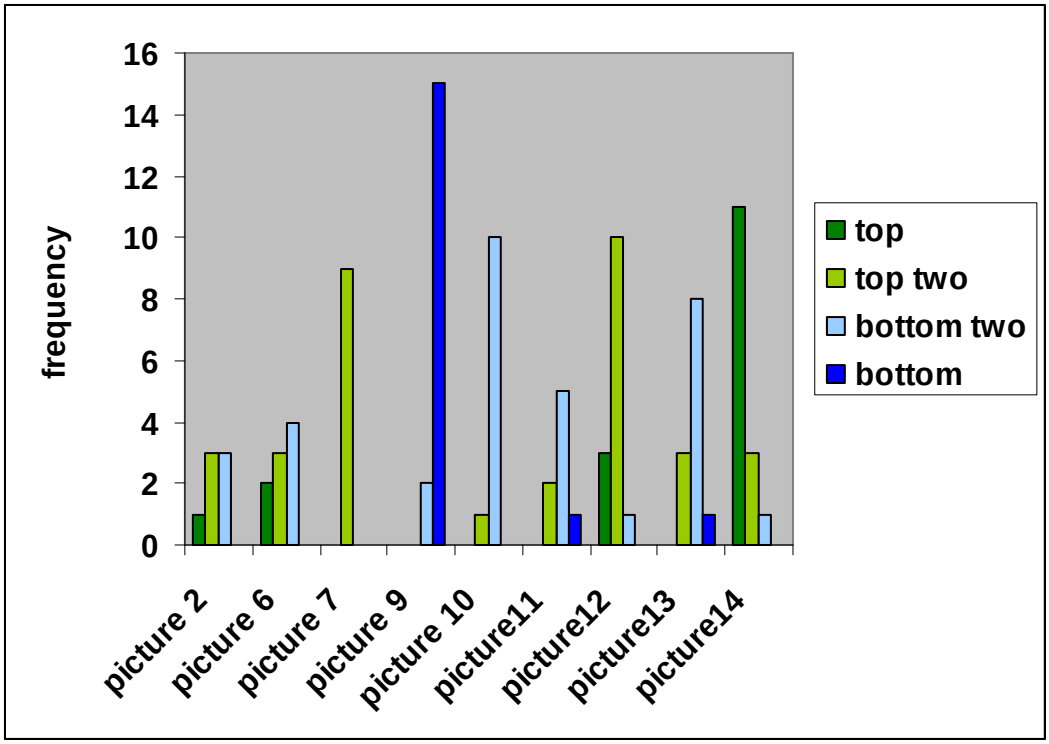

Figure 5: Bar chart showing the results of the diamond ranking

This allows a clear appreciation of the aspects of the school premises which are most clearly of general concern (shown by the almost unanimous placing of picture 9, the student toilets, at the bottom of the diamonds) and those where there is considerably more equivocation and mixed feeling. As can be seen from the bar chart, Pictures 2, 6 and 11 were placed in various positions in the diamonds and all seemed able to elicit a wide variety of responses, including general opinions and impressions about the school, which form a complex web of ideas.

Figure 6: Participant reaction to pictures 2 (left) and 6 was equivocal

Most of the participants were happy to carry out this activity, which provoked discussion between the participants and with the facilitator. However, a minority of the participants, the groundsman and one group of technicians, were reluctant to complete this activity, demanding instead that their views on the school premises were simply recorded. Although this was done, it was not then easy to feed these ideas into later consideration of information,

as the opinions given did not relate to the ideas produced by the other participants through the activities. The technicians engaged with the subsequent mapping activity, however, and contributed to our understanding of how learning spaces in the school were being used.

Map based activity (a): usage and preferred places

Participants were asked to choose one day of the week and draw the route that they would usually take throughout the day. Focussing on one day of the week, meant that the task was not overwhelming – either to complete, or to be 'read' later.

Once the participants had plotted their route, they then used stickers to highlight areas that they liked (a yellow sticker) and areas that they didn't like (a red sticker), adding comments to explain their judgements. Thus for instance, when one of the cleaners put a yellow sticker on a particular corridor of the school, she wrote that it was the flooring that she liked because it was easy to clean. The students and teachers who put red stickers on the same corridor related it to the narrowness and movement difficulties.

The maps provided a good starting point for conversation, perhaps better for some participants than the more open photo elicitation. Some of the staff and pupils were very obviously nervous when they sat down, but the mapping activity was practical and straightforward, and many people visibly relaxed, as they began to draw and discuss their views with one another. Using a map of the school enabled participants to pinpoint very specific features that they wished to comment on. The stickers were not over-used, and the picture that was created provided instant visual feedback to all. Although some of the students associated areas of the school that they didn't like with lessons that they didn't like, this was made clear through the written comments on the maps.

Use of the school

As might be expected, sketching individual use of the school on maps revealed both consistencies in use and contrasts between different groups of user. In general, the students' mappings covered much of the building, while teachers, and most other staff, tend to stay in more limited areas. For example, in the maps reproduced below, the Year 8 pupil visits many more places than the science teacher during a typical day.

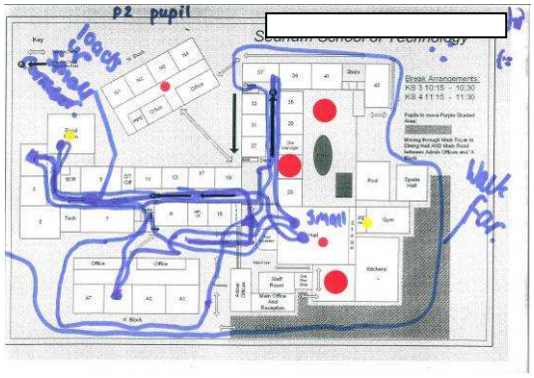

Figure 7: Student's map of school day

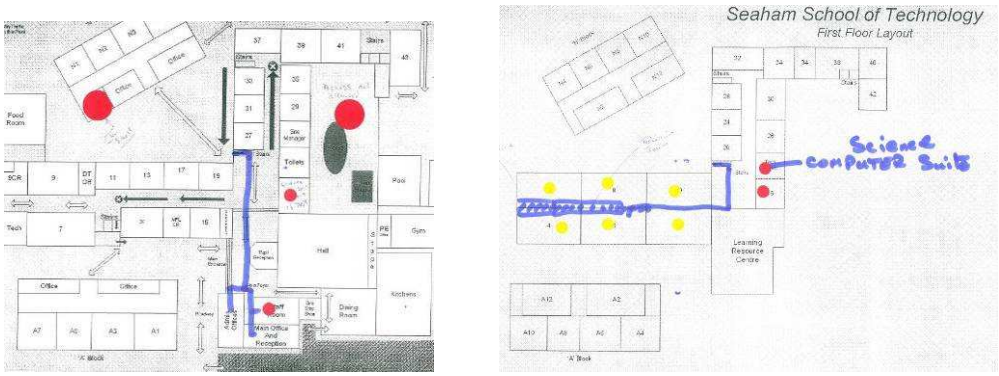

Figure 8: Teacher's map of school day

There are exceptions to this, with some (often more senior) teachers, the cleaners and one member of the administration staff drawing diagrams to show more extensive movement. However, the students' maps are considerably more likely to range over the whole school, consequently using more of the corridors, stairs and other circulation routes, as well as taking in more of the school facilities and various subject-specific rooms. Explanatory notes attached to the maps further related usage of the premises to particular roles. While pupils seem to experience the building in terms of the organisation of their school day, writing "break", "lunch" and "form room" on their maps, teachers' comments centred on their responsibilities, including the note on an exterior space of "Duty – out here all year!"

The recorded use of certain areas was heavily influenced by the role of the user in the school, with, unsurprisingly, teachers' mapping more often involving the staff room, main office and other administration space. Notably, though, some of the teachers did not show use of the staffroom, or only recorded a single visit, and this is consistent with other findings indicating that the staffroom was under-used.

Preferences

There are notable differences between groups of users in their preferences for particular parts of the building, which reflect time spent in different places, but also the position of the users within the school community. This becomes clear when the 'places I like' and 'places I don't like' are accumulated on two maps, one showing the students' responses and the other representing that of staff (figures 9 and 10). The following table (table 1) shows the numbers of stickers attached by students and staff to different areas of the map.

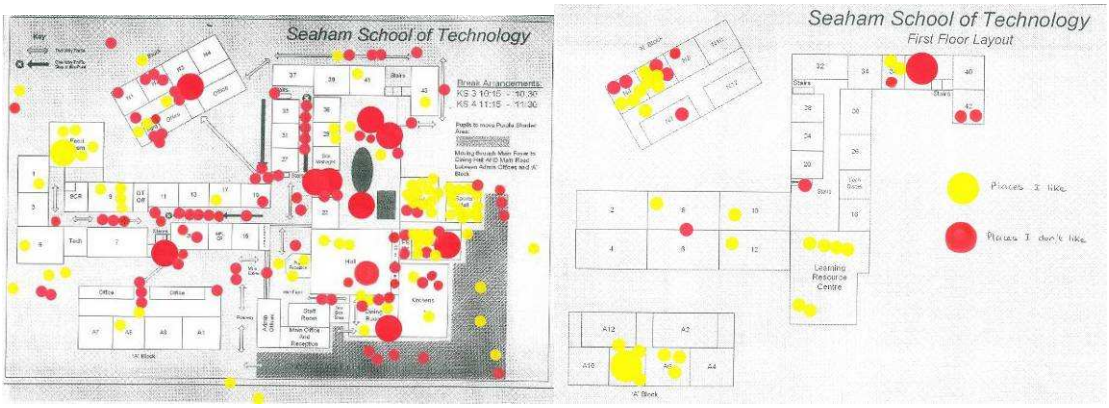

Figure 9: Liked and disliked places: collated responses of students

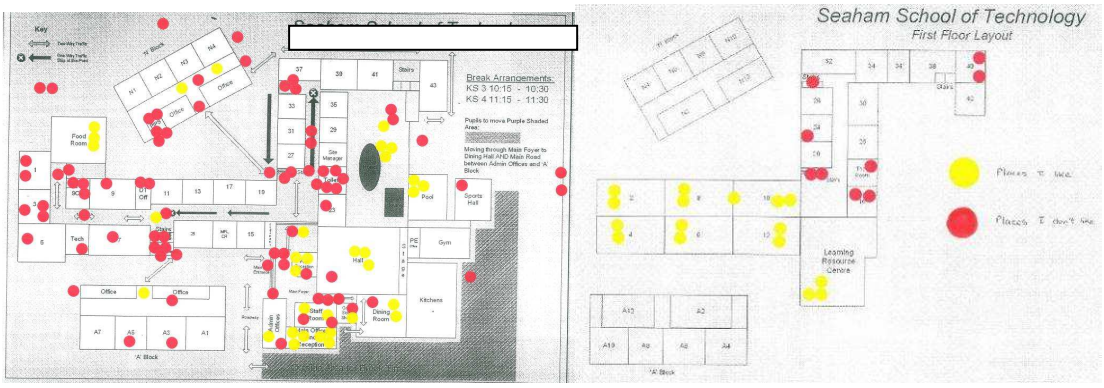

Figure 10: Liked and disliked places: collated responses of staff

	Students		Staff	
	like	don't like	like	don't like
Classrooms	45	24	15	22
Library	6	0	3	0
Food (cookery) room	8	0	3	0
Corridors, staircases	2	33	5	22
Outdoors	12	20	0	10
Dining room	4	7	2	1
Hall	3	5	3	1
Sports hall, gym, pool	28	9	3	1
Staffroom	0	0	2	2
Student reception, foyer	3	2	4	7
Garden	2	15	4	2
Student toilets	0	18	0	6

Table 1: Frequency of 'like' and 'don't like' judgements by students and staff

Inevitable differences in use of the building are reflected. The indoor PE facilities feature much more prominently on the students' map and the toilets are shown as more of a problem for students than for staff. Yet in both cases, the different users are broadly in agreement about whether these places are liked or disliked.

More distinct responses are seen to the garden area, which the students were much more likely to mark as disliked, writing comments such as "not allowed in", and sometimes adding the opinion that there is therefore "no point" in the area. A clear difference is seen between the way that the students and the staff, particularly the teachers, marked classrooms on their maps. Student stickers mainly reveal likes, rather than dislikes, though their annotations reveal that these are often related to reactions to the subject taught there, or to a specific teacher. Although the teachers did mark some classrooms as being liked, they more often marked particular rooms as disliked, giving reasons centring on problems with space and facilities. Finally, it is notable that the students much more frequently attached stickers of both colours to places outside the school building, showing that for many of them the spaces around the building are as much part of the school as those within its walls. When staff occasionally marked outside areas, it was with red stickers to indicate places where problem behaviour, such as smoking or climbing fences, takes place.

Considering the accumulated responses of all the users, however, there are also distinct consistencies that cut across pupils, teachers and other staff. As has already been noted, although problems with the toilets and the advantages of the PE facilities were more salient to

the students than to the staff, there is agreement on these and other issues about which are negative and which positive aspects. Further, the library and the food room were unanimously liked by all the school users involved in the mapping exercise. The maps also revealed some consistent problems with circulation. In particular, the plan of accumulated student likes and dislikes shows hot spots of dislike along the most heavily used parts of the corridors and at intersections, stairs and doorways. A similar pattern emerged from the maps produced by the staff.

In conclusion, when the information from all of the maps was transferred onto one map, a very clear picture emerged of the areas that are liked as well as those that cause problems. This picture, in conjunction with the details and, particularly, the comments from the individual maps provides comprehensive information. This map based activity was very successful in terms of quickly creating a relaxed atmosphere and thus facilitating the involvement of a wide range of participants, whose responses are revealing.

Map based activity (b): places that work

Partly due to some concerns about the usage mapping exercise being overloaded by additionally asking about preferences, another map-based activity was designed, explicitly centred on eliciting opinions about successful and failing places in the school. Then, if it did prove too onerous for participants to map usage and express opinions about the facilities, these would be captured by the other activity. Alternatively if, as was in fact the case, participants were able to describe their use of the premises as well as highlight preferences, then comparisons of responses to the two slightly differently focussed and phrased activities would prove illuminating from a methodological perspective.

In this map activity (b), participants worked either individually or more collaboratively on A4 or A3 maps of the school, using stickers, shading and comments to show ‘places that work’ and ‘places that don’t work’. The responses generally revealed very similar opinions to those found by mapping activity (a): the same particular places were considered problematic (e.g. toilets, stairwells) or successful (e.g. library) across the range of participants; circulation difficulties were made evident and again it was clear that there were mixed feelings about some parts of the school. Notes added to the maps and comments made by respondents clarified some aspects. In one case, that of the student reception, closer inspection of the maps revealed that the pupil reception is generally liked, and considered to work, but there are problems with crowds in the nearby foyer area.

Various problems relating to circulation are suggested by all the maps. Several of those interviewed felt strongly enough to transfer notes of their experiences to the enlarged *graffiti map* (see figure 11), including one Year 8 student who drew on her solutions to circulation problems in the form of a new corridor and an overhang along an external route.

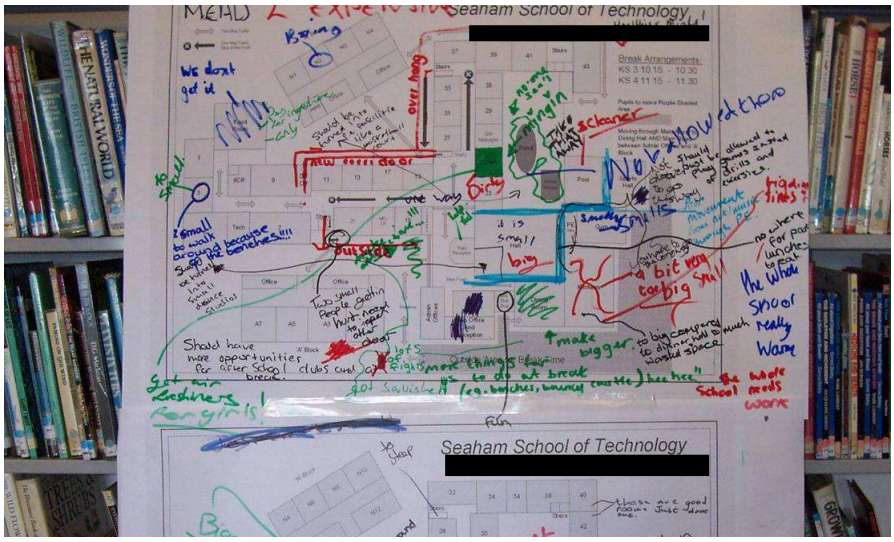

Figure 11: Graffiti map

Of course, the circulation and access problems relate back to the usage of the school, captured by map activity (a), but they also provoked discussion among respondents about improvements and solutions. This included debating the merits of the one way systems and the separate blocks. Many users felt strongly that having separate blocks for English and maths were aspects of the premises that either work or don't, and stuck stickers along the outside of these blocks to indicate this, a response which was not prompted by the more narrow focus on personal usage required by activity (a). Interestingly, this discussion was among those relating to layout which were developed in some depth, after the mapping activity had been fully completed, by a group of science, design and ICT technicians who chose not to engage with the *diamond ranking* activity.

To sum up, map activity (b) elicited broadly equivalent information to activity (a) about both problematic and successful features of the school premises. This validates the information derived from the activities, though it begs the question of whether it was necessary to include two mapping activities. Since activity (a) additionally provided data about usage and was perhaps slightly easier to introduce to the participants, it might be considered that this was the better activity. However, the more objective description of 'places that work' provoked more debate and discussion of wider issues among groups of participants than did the request for clearly subjective and personal 'places I like'. This wider perspective was seen in the discussion about separate blocks and in the suggestions made for improvements to layout and organisation.

Discussion

In the introduction, above, it was argued, following Banks (2001) and Harper (2002), that visual methods need to be more than ends in themselves. In the case of learning environments they need to contribute to improved understanding and, ultimately, to better design of school settings for learning. Therefore the success of the methods used by the present study need to be assessed in this light. Furthermore, it has been argued that choice of research tools will have an impact on the research, so it is important to understand our methods as completely as possible, and make choices based on methodology not convenience. This is currently of concern as it has recently become very much easier, through digital technology, to produce images for photo elicitation. It is therefore necessary to question how the various methods used in this study facilitated the participation of a particular school community and revealed their experiences of their environment. This study allows such reflection on, and comparison of, a number of visual tools, which is reported above in the results section.

Broadly, the school study undertaken can be considered to have succeeded in providing a range of valuable information from a cross section of users, enhancing knowledge about design issues within this particular school and deepening understanding of how current school environments contribute to the learning experience. The methods used were found to be central to these outcomes, as will be explored below, and, in the process, understanding has developed about these methods.

A central conclusion is that the methods did indeed facilitate the engagement of a broad range of people from the school community. Involving a wide range of people is generally considered essential to any participatory process and, furthermore, it was observed in the present study that the differing views of those with different roles produced a more complete understanding of the complex functioning of the school and the potential influences of this setting on learning. The use of photographs and maps, together with verbal discussion, avoided relying on literacy skills and confidence, which could be expected to vary quite widely across such a group of participants. The activities provoked immediate discussion among the participants and with the researchers, while, in general, participants appreciated having a fairly clearly defined activity to carry out with physical representations or producing their own representation. Tracing a route on the map, sifting through or trying to rank the photographs all seemed to provoke and focus discussion, so mediating between researcher and participant, as other researchers have noted in relation to photo elicitation (e.g. Banks 2001; Harper 2002). The only exception to this finding was the small minority of adult participants who were reluctant to complete some of the activities. This made it difficult to include their ideas because the activities, when completed, provided interlinking information and views, allowing, for example, for the experiences of those with differing roles to be both contrasted and combined, giving both depth and breadth to understanding of the school environment.

One concern prompted by this reluctance of a minority to complete the visual activities relates to concerns that the recent emphasis on involving children and young people in design might be leading to a tendency to overlook adults (Mannion 2007), which could systematically bias the process (Woolner *et al*. 2007b). Since the reluctant minority were all adults, it might be questioned whether the activities were really appropriate for all ages. However, the thoughtful and enthusiastic participation of the other adults, who represented the full range of teaching and support staff, and of most of these adults on another activity, suggests that the failure to engage was unfortunate but not inevitable.

Moving now to consider the information produced by the visual methods, some conclusions may be drawn. It was found that the photographs, although produced by a researcher not the participants themselves, were not overly restrictive or prescriptive: individual images were interpreted in a range of ways or suggested different ideas to those with different roles in the school. These ranged from reactions to the physical environment and comments about student behaviour to discussions of the possibilities offered for learning. The use, however, of a limited range of photographs considerably simplified analysis and allowed more links to be made between participants' experiences.

It might be questioned whether the range of activities was actually necessary or whether the same information could be produced by a single activity, given a broad enough range of participants. However, as has been demonstrated by the results reported above, the various activities enabled the triangulation of the perceptions of the participants through having varying appeal across the range of participants, producing different emphases and generating slightly different information. This concurs with the experience of the 'Mosaic' approach (Clark 2005) to investigating the responses of young children to their environment, and supports the tendency of practitioners in this area to use a range of activities. In this project, the map-based and photograph-based activities, in particular, complemented each other. To generalise, the maps tended to prompt consideration of *where* events took place, leading to

comments about organisation and movement, whereas the photographs provoked ideas about *what* took place, accompanied by description and judgements.

Triangulating across the activities both validated some general impressions and added further depth and detail. So, for example, the strong comments provoked by the photograph of the student toilets, its position at the bottom of the diamond ranking and the build up of red stickers in the location of the toilets all demonstrated the extent of dissatisfaction and provided descriptions of the nature of the problem. With more complex areas of the building, about which feelings were more mixed, the various methods highlighted different aspects and allowed a genuine understanding to be constructed. Since the effects of the different emphases produced by the differing activities were not entirely predictable, it seems advisable to use a variety.

A key requirement of the information produced by the activities was that it included both positive and negative aspects of the current environment, which could be used the following day as the basis for trying to design a new school. This way of proceeding was founded on an understanding of schools, familiar to historians, as on-going layerings of previous experience and infrastructure, where change occurs but continuities can still be seen. By starting from current experiences, it was hoped that the present study could tap into the 'accumulated memory' (Burke 2007, p.369) of the school community. For this to be representative, negative and positive ideas were needed.

Given that the school was widely perceived as inadequate by its users, it might be expected that positive aspects would be hard to find. Notably the tone of much of the discussion during the picture sorting activity was quite negative but the other activities, through explicitly requesting positive views, succeeded in provoking them. This ranged from diamond ranking, which necessitates a top-ranked picture, to the map based activities, where the appropriate stickers were provided, for 'places I like' and 'places that work', but participants could choose not to use them. These activities highlighted successful features of the school and also provoked some positive comments, annotations and discussions. It would seem that they did something more than just demand positive comments in the way that an interview question might. As an indication of this, when the head teacher was asked during the initial visit to the school what he liked about the existing school premises, he had replied that it was a "nightmare of a building" and opined that there was nothing good about it beyond the people within. Yet the positive impressions elicited by the mapping and diamond ranking, often about aspects particularly relevant to learning, such as the ICT provision or separate spaces for curriculum areas, were validated by discussions on the second day. It is clear that these methods uncovered a real, though less obvious, side to experience of the existing surroundings, which proved helpful in forming ambitions for the rebuild. This can be seen as another aspect of the success of the methods in building up a complex, yet coherent, and more complete, understanding of the school.

In conclusion, this study provided a valuable opportunity for a number of visual research methods to be used with a wide range of people from a school community. The discussions that occurred and the information which was elicited were judged very useful to the particular school, as well as revealing more about current experience of school environments. Considering the experience of using the visual tools, together with the understanding which they helped to construct, should encourage and enable more education researchers to use such methods. It is important, however, if this methodological opportunity is to be fully exploited to improve our understanding of learning environments that researchers go beyond the fairly familiar ground of photo elicitation. As this project demonstrates, straightforward photo elicitation might be able to tell us *what* is happening in a context, but it is necessary to use a range of visual and spatial methods to understand, in addition, *where* and to *what extent* things occur and to begin to suggest *why*.

References

Banks, M. (2001). Visual Methods in Social Research. London: Sage.

Baunfield, V., Hall, E., Higgins, S. and Wall, K. (2007) Catalytic Tools: understanding the interaction of enquiry and feedback in teachers' learning. Paper presented at EARLI conference, Aug 2007, Budapest, Hungary.

Bennett, N., Andreae, J., Hegarty, P. and Wade, B. (1980). Open plan schools. Windsor, Schools Council Publishing/NFER.

Blundell Jones, P., Petrescu, D. and Till, J., Eds. (2005). Architecture and Participation. Abingdon, Oxon / New York: Spon.

Burke, C. (2007). "The View of the Child: Releasing "visual voices" in the design of learning environments." Discourse: studies in the cultural politics of education **28**(3): 359-372.

Burke, C. and Grosvenor, I. (2003). The School I'd Like. London: RoutledgeFalmer.

CABE (2006). Assessing secondary school design quality. London: CABE.

Clark, A (2005) Talking and listening to children. In M. Dudek (Ed.) Children's Spaces. Oxford: Elsevier/Architectural Press

Clark, J. (2004) Participatory research with children and young people: philosophy, possibilities and perils, Action Research Expeditions, 4(Nov), 1-18.

Cohen, S. and Trostle, S. L. (1990). "Young Children's Preferences for School Related Physical-Environmental Setting Characteristcs." Environment and Behavior **22**(6): 753-766.

Collier, M. (2001). Approaches to analysis in visual anthropology. Handbook of Visual Analysis. T. van Leeuwen and C. Jewitt. London: Sage.

Curtis,E. (2003).School Builders. Chicester: Wiley

Dewey, J. (1938/1991) Logic, The Theory of Enquiry. The Later works of John Dewey, vol. 12, ed. Jo Ann Boydston. Carbondale and Edwardsville: Southern Illinois University Press.

DfEE (2001) Framework for teaching mathematics: Years 7, 8 and 9, London: DFEE http://www.standards.dfes.gov.uk/secondary/keystage3/respub/mathsframework/foreword/ (Accessed 1.11.07)

DfES. (2002). Schools for the Future: Designs for Learning Communities Building Bulletin 95. London: Stationery Office.

Dudek, M. (2000). Architecture of Schools. Oxford, Architectural Press.

Durán-Narucki, V. (2008) "School building condition, school attendance, and academic achievement in New York City public schools: A mediation model." Journal of Environmental Psychology **28:** 278-286

Estyn (2007). An evaluation of performance of schools before and after moving into new buildings or significantly refurbished premises. Cardiff, Estyn.

Evans, G. W. and R. Stecker (2004). "Motivational consequences of environmental stress." Journal of Environmental Psychology **24**:143–165.

Flutter, J. (2006). '"This place could help you learn': student participation in creating better learning environments." Educational Review **58**(2): 183-193.

Hallam, S. (1996). Improving school attendance. Oxford, Heinemann Educational.

Harper, D. (2002). "Talking about pictures: a case for photo elicitation." Visual Studies **17**(1): 13-26.

Hart, R. A. (1979). Children's Experience of Place. New York, Irvington.

Hartnell-Young, E. and Fisher, T. (2007). Circling the Square; six activities for listening to teachers and students. Nottingham: Learning Sciences Research Institute and School of Education, University of Nottingham.

Heppell, S., Chapman, C., Millwood, R., Constable, M. and Furness, J. (2004). Building learning futures, Ultralab.

Hickman, L. (1990) John Dewey's Pragmatic Technology Bloomington: Indiana University Press

Horne-Martin, S. (2002). "The classroom environment and its effects on the practice of teachers." Journal of Environmental Psychology **22**(1-2): 139-156.

Hunt, E. (1994). Theoretical models for the study of intelligence. In D.K. Detterman (Ed.) Current Topics in Human Intelligence Vol. 4. New Jersey: Ablex.

Inhelder, B & Piaget, J (1958) The growth of logical thinking from childhood to adolescence London : Basic Books

Könings, K. D., Van Zundert, M. J., Brand-Gruwel, S. and Van Merriënboer, J.J.G. (2007). "Participatory design in secondary eductaion: is it a good idea? Students' and teachers' opinions on its desirability and feasibility." Educational Studies **33**(4): 445-465.

Koralek, B. and Mitchell, M. (2005) The schools we'd like: young people's participation in architecture. In M. Dudek (Ed.) Children's Spaces. Oxford: Elsevier/Architectural Press.

Kumar, R., O'Malley, P.M. and Johnston, L.D. (2008). "Association between Physical Environment of Secondary Schools and Student Problem Behaviour". Environment and Behavior **40**(4): 455-486.

Lodge, C. (2007). "Regarding learning: Children's drawings of learning in the classroom " Learning Environments Research **10**: 145-156.

Mannion, G. (2007). "Going Spatial, Going Relational: Why "listening to children" and children's participation needs reframing." Discourse: studies in the cultural politics of education **28**(3): 405-420.

Maxwell, L. E. (2000). "A Safe and Welcoming School : What Students, Teachers, and Parents Think." Journal of Architectural and Planning Research **17**(4): 271-282.

Moos, R. H. (1979). Evaluating educational environments. San Francisco, Jossey-Bass.

Ornstein, S. W. (1997). "Postoccupancy evaluation performed in elementary and high schools of Greater Sao Paulo, Brazil. THe occupants and the quality of the school environment." Environment and Behavior **29**(2): 236-263.

Prosser, J., Ed. (1998). Image-based Research. . London: RoutledgeFalmer. .

Prosser, J. (2007). "Visual methods and the visual culture of schools." Visual Studies **22**(1): 13-30.

Richardson, T. and S. Connelly (2005). Reinventing public participation: planning in the age of concensus. In P. Blundell Jones, D. Petrescu and J. Till (Ed.) Architecture and Participation Abingdon Oxon / New York, Spon.

Rivlin, L. G. and M. Rothenberg (1976). The Use of Space in Open Classrooms. Environmental Psychology: People and Their Physical Settings. H. M. Proshansky, W. H. Ittelson and L. G. Rivlin. New York, Holt, Rinehart & Winston.

Rockett, M. and S. Percival (2002). Thinking for Learning. Stafford, Network Educational Press.

Rudd, P., Reed, F. and Smith, P. (2008). The Effects of the School Environment on Young People's Attitudes to Education and Learning. Slough, NFER.

Weinstein, C. S. (1979). "The Physical Environment of the School : A Review of the Research." Review of Educational Research **49**(4): 577-610.

Woolner, P., E. Hall, Higgins, S., McCaughey, C. and Wall, K. (2007a). "A sound foundation? What we know about the impact of environments on learning and the implications for Building Schools for the Future." Oxford Review of Education **33**(1): 47-70.

Woolner, P., E. Hall, Wall, K. and Dennison, D. (2007b). "Getting together to improve the school environment: user consultation, participatory design and student voice." Improving Schools **10**: 233-248.