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Shared visions? architects and teachers perceptions on the design of classroom environments

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Abstract
This paper focuses on the classroom environment and its effects on the practice of teachers. It is part of a PhD study that explores the relationships between the designed classroom and how teachers use it. It is based on semi structured interviews with teachers and architects.

Teachers are immersed in the physical classroom on a daily basis, intuitively modifying the space to improve the overall learning environment. Teachers identify what kinds of influence they had on the design of their classrooms and to what extent they are aware that they can design and influence their classroom. Architects design schools and have their own approach to designing a learning environment. This study explores the ways in which architects understand and influence the learning environment. Knowledge of what happens and how the school design system is organised gives both designers and teachers a greater awareness of learning spaces.

The interviews were cross referenced to identify how the two groups perceive the classroom environment and how much interaction teachers and designers have. There are similarities in these perceptions but also conflicting views of how the interactions do happen and what they contribute to the process. Understanding this relationship informs the degrees of impact that each group has over the classroom environment.

1 Introduction
Designing a school is a particular kind of project in the world of architecture. It belongs to the large array of institutional buildings that society creates. Designing these buildings (e.g. hospitals, schools, etc.) involves a series of procedures that do not occur when designing a private house. The interactions among people vary and the architect has to interact with a diverse group of people.

Teachers are the ones that use the classroom environment provided by the architect on a daily basis. They inherit spaces either in new buildings or old ones but no matter the condition of these spaces, they have to deal with the facilities in a way that permits their practice to take place. The classroom is no more than an enabling factor in terms of the effectiveness of the learning space. It doesn't create the ideal learning space but it enables or disables the teacher in their approach to create it. The ultimate success of a learning space depends far more on what the teacher does with the room itself. (Dick, 1997)

Nevertheless, the degree of communication between architects and teachers can affect the way in which the space will be used. Architects are not always aware of the ways teachers use the space. This becomes critical when learning spaces have not been designed to allow the teacher to use a variety of teaching and learning methods, or the teacher adopts a particular method for which the space has not been designed. (Smith, 1974)

2 Methodology
2.1 Architects
In order to identify the ways in which architects approach the problem of designing a learning environment, I interviewed architects providing specialist design services in educational settings.

The Royal Institute of British Architects (RIBA) directory was used as a source of reference to identify possible practices. Sixty-six practices were contacted and thirty-nine replied. Twenty-three did not have relevant experience in school design to participate in the study,
sixteen practices provided specialist services in school facilities and these form the study group.

A semi-structured interview format was employed with all these architects. These provided a deeper understanding of the procedural aspects of designing a school as well as their personal understanding of an educational setting. The interviews were recorded, transcribed and analysed.

2.2 Schools
In schools, lessons are being observed. A grid layout of the classroom is being used to identify and classify the physical elements within it and I am tracking the teacher's movement and interactions with pupils. Additionally, the teachers are being interviewed to identify what kind of influence they had on the design of their classrooms and to what extent they are aware that they can design and influence it. This is taking place in the context of primary and secondary schools, and in general and specialist (workshops, laboratories and studios) classrooms.

This paper results from a pilot analysis within a larger study. Eleven interviews from teachers of diverse subjects in two secondary schools are used here to cross reference the architects' interviews. The interviews were recorded, transcribed and analysed.

3 The importance of human-environment relationships
It is the architects' belief that buildings affect people. What architects design influences the users in the spaces.

"...I wouldn't want to be an architect if I didn't think that buildings, and the environment they create, are important..."(Int.09)

The field of environmental psychology is concerned with the relationship between people and the environment. There are a few, if any fields that do not, at some point, touch on the relationship between man and his environment. The environment plays a significant role in the lives of people (Rivlin, 1985). Man is an active organism that can both select and modify his own surroundings. As Lee puts it, it is predictable that the most potent influences upon man and man's most powerful influences upon the environment will be found to be mediated through physical features which in turn control social behaviour. Our experiences within the environment give rise to emotions and beliefs, feelings, attitudes, judgements and values.

"...buildings in general do effect the people that occupy and use them. ...You can have pleasant rooms, ... nasty rooms, you can have useful ones and useless ones, ...you can have rooms ... with historical ...value, you can have futuristic ...ones, and I think that when you walk into those kinds of spaces..., they have more effect on you than you can ... actually realise..."(Int.03)

4 Architects' procedures designing a school
The process of designing, constructing and maintaining a building has many common aspects across different settings. The initial motives for construction can be either need or profit. To realise a profit, for instance, developers must construct a building within some cost range. Then there are decisions regarding zoning laws, codes, legal and political constraints, the economic criteria and so on. The design team must use current technology on construction and also be aware of the social and cultural expectations in producing a new building (Heimstra, 1978). Creating a built environment is not a freewheeling process and architects may feel they have many constraints on their work.

4.1 Commissioning of school projects
The architect can be commissioned by an educational developer or be appointed by a Local Education Authority or even by the school itself. It depends on what kind of school it is (e.g. voluntary-aided, grant-maintained, LEA, independent) and what the source of funding is. The Educational Developer who represents the educational department where the school belongs to (e.g. Local Education Authority, Diocesan Board) is normally the one responsible for commissioning educational buildings. Because of this diversity in the commissioning, the architects view of who is the client, is not
clear. Being an institutional building also adds to this confused context.

4.2 Who is the client
There is no one client. Rather as one architect put it, it is a "multiple client" scenario. There is the financial client, the person paying for the job, and the user client, the school (that can also be the financial client).

Once an architect is commissioned, the client and the designer together are responsible for stating clearly what the building is expected to do. This document is the brief of the project. The brief should reflect a broad array of concerns affecting design decisions. These are economical, cultural, structural, sociological to name just a few.

4.3 Development of the project brief
The brief quantifies design requirements such as the amount of floor space, types of spaces, materials and any other aspect relevant to the design. The generation of the brief is an important procedure because if it is wrong, the building will not work. It can take several formats. It is common for the architect to receive a standard brief developed by the Education Authority. Sometimes the brief may be developed in conjunction with the school, using schedules to document all the requirements. The spaces are carved out of a total area that is either given by the school, by building regulations or as a result of the cost.

5 Teachers' perceptions of the classroom environment
In examining teachers use of the classroom space, architectural elements have been classified in terms of hard and soft architecture. This classification is a further development of Steele's (1973) division of space. He considers the space divided into fixed, semi-fixed and pseudo-fixed features. I divided the space into two major groups (hard and soft architecture). The degree of impact that teachers' have over these elements varies greatly according to their personal environmental awareness and sense of control. Individuals vary in the degree to which the physical environment affects them, some people are more aware of the environment than others. (Heyman, 1978)

There are elements in the classroom that cannot be changed by a teacher. These are elements of the hard architecture that are fixed (e.g. walls, windows). But there are elements that can be changed in varying degrees. These are features of the soft architecture. These can be semi-fixed, changeable with some effort (e.g. built-in furniture, sinks, radiators, in general, the services concerning water, electricity and gas). Semi-flexible features are heavier elements (e.g. filing-cabinets, bookshelves) often perceived as relatively fixed. Flexible features are elements that can be easily moved (e.g. chairs, tables).

If a teacher wants to make the physical environment work, it is important to learn about the changeable features and the many ways that they can be changed. Teachers have different perceptions of change according to the hard and soft architecture features.

Only one teacher from 11 (used in this pilot analysis) perceived some control over the fixed features. Not surprisingly, this was a design and technology teacher. All other teachers considered themselves having no control of change over the hard architecture.

Soft architecture had varying degrees of perceived control of change. These are caused by the different perceptions of what teachers perceive as semi-fixed, semi-flexible and flexible features. It relates to their personal environmental awareness of what is changeable.

"I can change anything I want to ... within the bricks and mortar of the building."(Int.02T)

Teacher 02T perceives no problems in changing the features of soft architecture.

"... I’ve changed the arrangement of the furniture. ... the current bookshelf ... was at the back of the room, I now have it at the side...it’s for my access ..."(Int.03T)
“We’ve moved the furniture around, we have plans to change again before Christmas...” (Int.06T)

Furniture is easily moved around by these teachers. Note that teacher 03T perceived the bookshelf as movable even being a heavier element. The same category of features (semi-flexible) is perceived differently by teacher 16T.

“The filing cabinets... I can’t lift them much anymore...” (Int.16T)

Teacher 16T would not consider emptying the filing cabinet to move it to a more suitable place.

“I can’t change the position of power points...” (Int.15T)

Semi-fixed features (as services) are more complex to change requiring professional help but often alternative solutions can be found, power extensions, for instance.

“...The cupboard doors won’t shut, you have to wedge them with bits of paper.” (Int.12T)

The teacher’s capacity to ‘make do’ with minimal provisions often means that optimum arrangements are not developed (Gump, 1987). Teachers adapt their teaching to the supplies and equipment that are available (Johnson, 1990).

Another issue regarding the effects of the physical environment on the practice of teachers is how much teachers take account of their environment in planning their lessons and whether they think the room interferes in their teaching styles. Six teachers (out of 11) took account of their environment in planning their lessons but even the ones that do not deliberately plan with the use of the environment in mind, think that the environment affects their teaching styles.

“...I will change the format of the classroom depending on the type of lesson that I want to teach.” (Int.16T)

Only three of the teachers were satisfied with their classrooms. The others were either dissatisfied or had mixed feelings in relation to their rooms. Teacher satisfaction does not necessarily lead to student learning but satisfied teachers are better teachers (Gifford, 1987). Could it be that one of the factors contributing to the teacher dissatisfaction is their lack of involvement in planning a favourable learning environment? (Jones, 1981)

6 Architects and teachers' interactions

The interaction between the designer and the teacher occurs only in specific instances. During the design process, the contact in the school will normally either be the head teacher or a liaison person appointed by the school. There are occasions in which an individual teacher will be consulted, but that would normally be in the case of a specialist subject and most probably will be the head of the specific department, not usually the teacher that will be using the room. It is common procedure for the architect to contact the financial client before consulting the school. The financial client can give ‘free access’ of communication between the architect and the school but in any occasion when major decisions have to be made, these have to go through the approval of the financial client.

The architect mediates the requirements of the school and the regulations, having to satisfy the users' needs and comply with the regulators requirements.

At the same time, the architect had to go through a series of intermediaries to reach the end user (classroom teacher). The intermediaries here can be the financial client, the head teachers or head of departments, the school governors or the approval process. There is the risk of a communication gap.

These intermediaries act as filters so that the architect can mediate what most teachers want without customising specifically for an individual. The result should be a flexible enough space so that the teacher can customise and adapt the setting according to his/her needs.
However, this situation may create a tension where the teacher can feel powerless in terms of direct input towards the architect.

One of the two schools illustrated in this paper was going through major extensions work and the interactions that occurred can be clearly stated through the quotes below.

Interview 14: Architect

“...Any designs that we do go to the client at the Corporate Construction (LEA) first and then ... the education department and then the school ...”

“I have talked to the teachers, ...but .... most of the liaison with the school has been done through the gentleman we've... mentioned ... He's been appointed as the liaison officer at the school’s end ... so when I produced drawings of the school or individual classrooms, they've been fed back through him ... It makes it easier for me rather than talk to 20 different teachers who all might have slightly different ideas about the way things should be ...”

Interview 02T: Teacher - liaison of the school

“...as the co-ordinator ...I would expect to meet with all the staff involved ... and feed that information back to the architect. I wouldn't expect every member to meet the architect personally. ... I'd expect someone like myself to filter.”

Interview 04T: English teacher of the school

“...the architect ... they seem to already come in with preconceived ideas of what they are going to do or they've already got a prescribed plan. By the time it gets down to us seeing an architect, ... it’s too late because the plans and everything had already been drawn and it’s going to go forward anyway. So ... they haven’t involved the staff at the beginning"

“Basically what we've got is a liaison that is looking at the curriculum and maintaining the curriculum for the school. He's not actually looking at the fabric of the building. What he is looking at is if we close that classroom where we can relocate Maths to for two weeks while that gets built and where we can move to next. He’s not actually looking in terms of ‘wouldn’t it be nice if we had this facility’ .... As far as I can tell, the plans were already developed, that's what we are going to get. He is purely there to make certain that as they close this classroom down, another classroom will open up so that we can actually function as a school. Not in terms of the quality of the building that we get.”

The interesting factor about these quotes is that they illustrate three very different perceptions of the same interactions. Note the hierarchy given by the architect in terms of the designs produced. He would first present the drawings to the Local Education Authority building sector. This would then be presented to the Education Department and only then the school would have access to the drawings. The architect perceived the teacher liaison as a facilitating filter inside the school. This teacher would feed back to the architect with the school’s information. The teacher liaison believed himself to act as a filter. A non involved teacher of the same school perceived the architect and the teacher liaison as having other roles than the ones described. He believed the architect had preconceived ideas and the teacher liaison to be no more than a manager. These three perceptions illustrate clearly the quality of communication and how diverse views can be.

7 Conclusion

The overall analysis of the interviews reveals different perceptions of the classroom environment by architects and teachers.

No matter what the designers want or expect, people who use the environments redesign them. It is an adaptive redesigning. Every teacher becomes a designer, responsible for preparing the environment to achieve his or her educational objectives. Because of the hierarchical nature in which the classroom is designed and the fact that classrooms are inherited by teachers, there is a tendency to create a situation towards a passive acceptance of what teachers are given.

As Johnson suggests, teachers are often not prepared to use the environment in a positive
fashion. It is necessary to find ways to give teachers greater authority in designing and redesigning the spaces in which they teach. (Johnson, 1990)

Looking at the hard/soft architecture continuum, teachers in this pilot study clearly feel they have no control over the hard architecture and have diverse perceptions of control over the soft architecture. Most teachers feel they have control over flexible features but the perceived control of change over semi-fixed and semi-flexible features varies greatly.

If architects and teachers were in dialogue about the teaching environment, I believe that:
• the inherited environments would probably be more sensitive to the task of teaching,
• the dialogue would be empowering and enriching for teachers; encouraging them to question the setting and therefore enhance their control of change of the environment.

This raises important issues for the initial teacher training and professional development, since part of the teachers’ job is to take responsibility for the design of the classroom. They need to be prepared and empowered, not defeated and trapped by the environment.

The physical environment is not a substitute for effective teaching and educational planning. So no matter what the architect’s intentions were, it is the teacher that has to deal with the environment. Every teacher needs to become a designer, taking responsibility for developing their space. What the architect provides is a ‘finished beginning’. The implications of this should be recognised directly in teacher training and in teacher’s professional development in terms of environmental awareness. Such awareness would enable the teacher to analyse the learning spaces more critically and become autonomous in their control over the setting.

Notes
1 When the word man is used, it means human, people, individual, children, women and men. This is mentioned here to avoid any kind of misunderstanding or confusion that might occur with the use of the word.

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