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## **Evaluating the Impact of Learning Space**

### **Purpose**

Seeks to find a method to analyse the impact of learning space on learning behaviour and, in particular, learning support, using the context of a university library.

### **Design/methodology/approach**

A method was created based partially on pre/post occupancy evaluation methods used in other institutions, and partially on methods utilised by the Library on other occasions, gathering qualitative and quantitative data from staff observations, desk enquiries and student use. The method was tested at the University of Huddersfield Library and Computing Centre following extensive refurbishment.

### **Findings**

The method overall was deemed successful, but was problematic due to lack of student engagement.

### **Research limitations/implications**

Research was conducted at one university only, so can be considered either a starting point for further research, or as a toolkit for other universities to utilize.

### **Practical implications**

Ensuring full understanding and engagement of students via academics would increase potential of the method for understanding learning behaviours and utilisation of the library.

### **Originality/value**

Assessed what impact library usage and potentially newly observed learning behaviours made on library staff.

### **Introduction**

Use and design of space in higher education is a theme that has come to the forefront of educator interest in the past few years, particularly as competition for student applications and retention issues in the university sector have increased. It has long been accepted that space quality and design impacts on the educational experience and working life, and environmental factors figure substantially in the study of psychology and sociology (see Jensen (2006) below, as well as Strange and Banning (2001) and Gallagher (1994)). However, while there is a great deal of research on and discussion of higher education (HE) space (re)design to reflect new modern student needs, there is little assessment of how learning spaces may or may not change student learning behaviour and space use, or indeed what modified student behaviour means for staff supporting them in the new environment. In 2009 the University of Huddersfield aimed to deal with this issue, with focus on the staff support element in particular in terms of its library spaces. The University chose to concentrate on designing and assessing a method that would provide informative data to allow researchers to make decisions on space design/configuration and examine the impact on library staff resulting from pre and post-occupancy formats. The following literature review identifies key methods utilised by others in the education sector, while demonstrating that there is a clear gap in examining how support staff react and respond to student use.

### **Schools**

Design of learning spaces has stimulated a great deal of discussion in school contexts, and in contrast to an HE consideration has been an interest for some time. Jensen (2005, p. 81-93) discusses the importance of classroom design in terms of basic environmental impact. He demonstrates that

providing movable seating and maintaining a flexible view of classroom arrangements according to the task in hand can reduce stress in students and thus improve their responsiveness. He also provides substantial evidence to demonstrate that temperatures, lighting, noise and colour schemes impact on the quality of classroom behaviour. Scott-Webber (2004) considers classroom desk layout in terms of an 'assembly-line learning pattern' developing from the Industrial Age to create a heavily teacher-led approach. However, in recent years more research has been conducted into format of classroom and environmental issues influencing student behaviour and quality of teaching. Some studies take the environmental perspective as the primary point of research, investigating to what extent school facilities are utilised appropriately (Zhang and Barrett, 2010), who also discuss the desk format classrooms use to a lesser extent), or to what extent overall 'good' or 'bad' behaviour is modified in varying levels of environmental comfort (Bernardi, 2006). Tibúrcio and Finch (2005) consider intelligent classroom spaces utilising new technology, and their impact on student interactions and teaching. They found new classroom designs featuring flexible movable furniture and modern technology resulted in lesson plans involving more student centred classes and more interactions between students and between students and teachers.

However, these studies place very little consideration into what impact the environments they examine have on learning. Leung and Fung (2005) do consider overall learning response in their comparison of pre and post occupancy of 750 primary school students across three schools. Their perspective compared environmental elements ("facilities management (FM)") with learning behaviour based on a questionnaire issued to the students, and found no significant correlation demonstrating improvement in behaviour directly relating to improvements in facilities as a whole. However, they did find correlations between individual elements of behaviour and environment, including collaborations between students, attention levels and goal achievement each with environmental elements.

### **University spaces**

With the increased interest in creating new higher education learning spaces, various organisations created guidelines to support institutions planning refurbishments and new builds. JISC (2006a), HEFCE (2006) and the Space Management Group (2006) have all discussed a need for designing learning space to maximise student learning potential, and both HEFCE and JISC (2006b) have produced toolkits for evaluation purposes. Additionally, the Association of Research Libraries (Stuart, 2008) and the International Federation of Library Associations and Institutions (IFLA, 2007) have compiled advice for designing and monitoring library spaces. Pre and post-occupancy evaluation is thus a frequent point of research amongst higher education, combining both a need to closely examine space utilisation with various methods of assessment to encourage student engagement and increased responses.

University space research overall tends to be heavily focussed on technological modifications. Tom et al. (2008) assessed new classrooms installed at the University of Missouri-St Louis which had a variety of furniture styles including soft furnishings and moveable desks, small round group desks, laptops with wireless access, and screens around the room for projecting teaching materials and student submissions. While no change in grades was found, the use of staff observations, blogging of students and staff, and surveys, led to the conclusion that the classrooms had greatly improved the number of interactions between students, and increased flexibility moving away from the teacher-centred format meant a higher level of student engagement with the teaching. Whiteside et al. (2009) similarly found that modifications in classroom design led to increased interactions. Their flexible classrooms were primarily based around circular desks with larger group accommodation, with laptop facilities and screens across all wall space. Findings indicated the space was interpreted as stimulating, accommodated increased communication between students, and teaching styles were adapted to be more interactive and student centred.

Aspden and Thorpe (2009) moved outside of formal learning spaces and asked students at Sheffield Hallam University to use Twitter to log where they chose to study, having already used reflective learning journals, photo diaries and the creation of photo stories. Twitter was found to help encourage participation of students in the research process as it was familiar, enabled easy and speedy feedback, and allowed students to comment and elaborate on each other's choices.

However, Könings et al. (2005) have an interesting comment on how students react to learning spaces. They cite Entwistle and Tait (1990) and Doyle (1977) in stressing that the learning environment's characteristics specifically do not influence student learning, but rather it is the student perceptions that direct interpretation of space. Könings et al. say that, however well designed and powerful the environment is, however well implemented by staff, it is "students' perceptions of that learning environment [that] will determine what kind of learning activities will be employed, and of what the learning outcomes will be."

### **Information commons and libraries**

Where library spaces are concerned, numerous studies have investigated what students use the spaces for, and examine to what extent a change in design modifies or reflects student demands. Bryant et al. (2009) explore student use of the library at Loughborough University using ethnography, having already collected quantitative data in a previous study (Walton, 2006). The library had been refurbished 2 years prior to the ethnographic study, with an open plan area for individual or group study, allowing refreshments. Research demonstrated that collaborative spaces were used for group work in terms of brainstorming or preparing for presentations, but also for quiet study in proximity to fellow classmates. Students were also observed using large group tables for individual study, despite the availability of individual study desks on other floors. The study mentions librarians felt the new area was not conducive to studying due to noise levels, and a large proportion of students (43%) complained in a library survey. The space was also found to be used as a combined social and studying space. The research touches briefly on library staff passing through the area, but only in terms of what they were doing i.e. passing through the area, and were rarely seen as requested for support by any library users.

One of the broadest and most extensive pieces of research is discussed by Foster and Gibbons (2007) at the University of Rochester's River Campus Library. The library wanted to know more about student habits and the nature of their studying, and utilised the expertise of an anthropologist to investigate: student study habits away from the library; academic staff expectations for assignments; and student space preferences and design ideas. Their research extended to video recordings of student studying activities in their dorms, and photographs taken by students of spaces they used throughout the study day outside of their library use. Staff monitored visits and peak usage times of the library, and surveyed student support needs at the reference desk (with a follow up survey asking whether the support they obtained was of use and helped them with their assignment). Additionally students were asked for their ideas and feedback on the library spaces encouraging them to submit furniture and space requirements for a new area to be designed, and feedback on the library website. The authors found that as well as gaining a better understanding of the University's student body, the research process aided library staff participating in data gathering to understand student perceptions and methods and improve the support they provided, but emphasise that their research is about *their* students. The nature of different universities and library environments demands that institutions carry out their own research to discover the needs, perceptions and habits of their own students.

In his discussion of refurbishment at Longwood University Library, Haug (2008) describes how staff observations were used to create new learning spaces providing group computer workstations with

additional screens, extra chairs, flip-out whiteboards and fabric partitions separating each workstation. The Library then conducted post-occupancy evaluation of students with a survey of quantitative and qualitative questions. Having found that students felt there needed to be more screens and chairs made available, and staff observing some students working alone spread across group workspaces, they concluded that students had increased levels of collaboration, but that some also needed educating in the use of the new spaces.

While it is accepted that individual preferences are a factor in the use of flexible learning spaces, evaluation of completed designs is conducted at a very basic level, and so appears to leave a marked gap in terms of an informative process of evaluating learning space in a learner context. Temple (2008) expresses concern at research that attempts to connect learning space with improved student achievement, describing several studies where he feels special treatment and differences in teaching methods lead to tenuous conclusions. Temple goes on to conclude that there are methodological difficulties in collecting data that is clearly of some importance and expresses concerns that there is a gap in research linking design recommendations claiming to improve student creativity and productivity. He expresses fears that while new technology is being incorporated into new environments, it may require frequent updating, and that ultimately spaces should be flexible and comfortable. Weaver (2008, p. xviii) additionally expresses concerns that there has been very little research examining how learning spaces impact on learning behaviours, and thus support for learners.

### **The University of Huddersfield project**

On the basis of Weaver's comments in particular, in May of 2009, the University of Huddersfield granted funding to an internal application for research into the impact of learning space on learning behaviour and learner support. The main purpose of the research was to develop a formal method for utilisation at other institutions, basing the collection data on a mixed method approach. The funding bid was submitted by a member of library staff with the intention to trial any method developed within the library space at the University, involving Weaver as a member of the steering group.

The library had just completed a full refurbishment over the course of 3 years, meaning that a broad variety of spaces had been developed providing a mix of blended, group and individual environments to examine during the research. Key refurbishment spaces included:

- areas for quiet discussion incorporating soft furnishings;
- high technology spaces with plasma screens and smart boards;
- a new music library area with soundproofed rooms and listening pods;
- increased number of computers to 500 across the 5 floors of the building.

Each floor was a base for a specific subject area, with the main entry floor serving as a one-stop shop for library, computing, binding and student services, incorporating 24 hour PC and Mac labs. The method would ideally be developed to look at formal learning spaces across not just those designed for independent study, but for formal study including classrooms.

The project aimed to look at learning space assessment in terms of: how learners use and communicate within and with the space i.e. does their use reflect the design ethos of that area, how do learning support workers interpret learner use? The research was also intended to inform any future development of learning spaces. As the literature provided advice on the process of modifying and evaluating space, including consultation with academics and staff and sometimes student feedback but without any analysis of learning productivity, methods were drawn on to modify to try and include that data.

## **Method**

Utilising the literature reviewed, a combination of qualitative and quantitative methods were selected to gather data on various levels. It was deemed important to use mixed methods to gather a broad picture of student space selection as well as actual usage. Similarly staff observation and opinion were considered an essential part of the process.

### **Data collected representing staff space interpretation and impact**

- In July staff were asked via email to submit their observations of and comments on the library space. An email (see Appendix 1) was sent to all library staff asking them to comment on pre and post-occupancy use of the library, comfort and basic human needs and whether they are satisfied successfully, make suggestions based on behaviour they had observed and ask questions as to where behaviour may derive from. The purpose of the survey was twofold; to derive data with which to help launch further data collection, and to act as a pilot to help prepare staff for further reflection and space observations for a survey at a later date (see reflective logs below). The email was designed to specify that critical or complimentary observation was welcome, but needed to also be reflective and question why problems may arise in particular areas. Submission format was kept flexible to encourage staff participation: no specific questions or forms were provided, but some prompts were made to direct the nature of the data. Staff were given until the end of August 2009 to submit observations and comments.
- A quantitative collation of the nature of subject desk enquiries. Data from this survey would be used in part to measure the level of student contact with staff, and also how much of this contact was related to their learning process, or of a technical (i.e. IT) or practical basis. Enquiries were classified as subject related, photocopying, IT/computing, directional, and procedural (i.e. how to renew books or book a group study room). Subject desks at this time were supported by both qualified librarians and library assistants whenever an enquiry arose, as opposed to constant staffing; library assistants were asked to provide initial support where possible, and ask librarians for guidance if necessary.
- Completion of reflective logs on a weekly basis. Logs were designed based on a format used successfully by Margaret Weaver (a member of the project steering group from the University of Cumbria) to prompt thoughts on unexpected use of spaces, furniture use, how well space functioned according to their designed purpose, as well as how students appeared to regard space and its design (including issues with privacy and library regulations, and comfort levels across the floors). Logs were issued in November 2009.

### **Data collected representing student space use and interpretation**

- An extensive quantitative study of library space was conducted to measure where space usage was high or low. Every week day during the November collection period, staff collected data 4 times a day between the peak usage hours of 11.00 and 15.00. Staff from the subject teams were provided with forms detailing the number of seats available in each furniture type, in each area of each subject floor. The count was of empty seats to make the process as speedy as possible. Unusual activities, such as furniture moving, or specialist (i.e. teaching) bookings of rooms were noted on the form.
- Learning logs were issued to staff in a school representing the subjects of each floor within the library. Students were required to fill in a page of the log for each library visit they made, detailing the time and date of their visit, what they wanted to do in the library, how they planned, and how the library as both a space and a support network helped them achieve their goals. Student groups were provided by volunteering lecturers, who issued the logs to their students and provided them with instructions.

- Students completing learning logs were issued a USB stick and asked to submit photographs of their favourite and least favourite spaces to a blog, describing why they used or didn't use particular areas.
- Customer comment forms were used to contact continuing students who had expressed positive feedback on the refurbishment to request their attendance at a focus group. This would measure what impact the refurbishment had on their learning behaviour and whether it had influenced their learning space choice. The students were offered refreshments for attending.
- A short survey (see Appendix 2), collecting a mixture of qualitative and quantitative data, was issued to students leaving the library by staff on the reception desk throughout the day, to a total of 311. Most surveys were completed at the desk and returned immediately. The survey asked for data similar to that in the learning logs, but also specifically asked for information on resource use, whether they ever used particular types of spaces, what their favourite was and why.
- During February 2010, an opportunistic sample was taken of students in each type of space, gathering data on their preferences and study goals. A pilot was conducted at the end of January, and the final data collected during a period where assignments were due for submission, thus collecting more substantial learning-specific data. A questionnaire was created using the format of the learning log and reception survey with two members of staff briefly interviewing library users. Three inhabitants of each space on each floor were interviewed where possible, with some variation to reflect the nature of the space (for example learning space within the archives area was limited to one respondent as space is both extremely limited and designed with a highly specific purpose). A pilot survey was conducted initially using the entry level of the library and interviewing a total of 11 visitors. In the final survey, a total of 57 out of a potential 67 respondents were surveyed on the subject floors, due to lack of usage in some areas.

## Results

Qualitative and quantitative data returned from surveys helped to create a broad image of how, when and why students did or did not select library spaces over other choices.

### *Staff data*

The initial email in July resulted in 18 responses out of a possible 108 employees (approximately 16%). The total number of staff members is not necessarily reflective of a response rate, as due to the time requirements of the project funding, the email was released during the summer vacation where part time staff may not be working, and included staff members who would not regularly pass through areas of the library where students are working. However, all library staff were included in order to try and gather as much data as possible, with the assumption that, if a staff member does not work in a front line position but at least passes through a student area, they may still be able to provide some insight into space use. Comments were uninhibited and varied in nature from highly critical to constructive to detailed observations. Where comments were particularly provocative of discussion or needed clarification or more detail, a response was sent requesting further detail or questioning what implications the comment may have, in some cases leading to an informal discussion with details logged and added to the data. Criticisms fell into several categories including inappropriate student behaviour, space design and some basic needs e.g. temperature. These comments were largely accompanied by suggestions for how issues may be resolved.

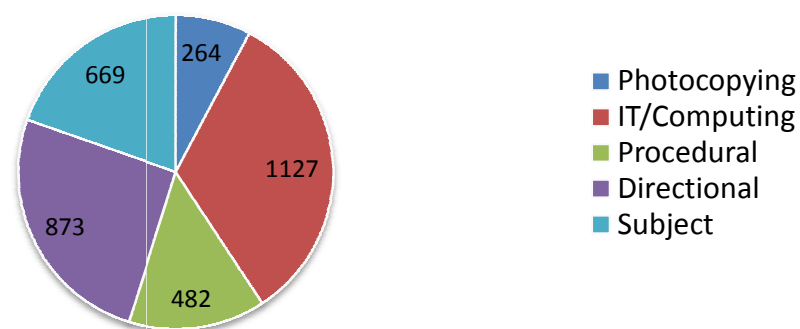
In terms of how students used the library, observations were primarily on group use of spaces and behaviour viewed as inappropriate for a learning space. Students were observed to use spaces for group use regardless of whether it was designed for that purpose, and regardless of whether they

were studying or socialising. Bookable group rooms were described as being used by all types of students for all purposes, in spite of rooms being designated for specific purposes e.g. listening rooms for music students were requested by students looking purely for a free space separate to the main floor. Some staff were concerned that organisation of furniture and student habits built up prior to refurbishment meant that spaces were interpreted for use it was not designed for, for example use of the new Music Library was initially largely populated by students who had used the pre-refurbishment quiet discussion room for humanities students in that area. Furniture in the area was viewed by staff as encouraging use by non-music students to use it for socialising i.e. couches and cushioned armchairs in the entrance to the area, and staff discussing this area viewed the space as somewhere purely for music students. Some staff commented on how they were struggling to re-educate students in the use of some areas, as in the previous example, and in some scenarios staff provided examples where they had asked students to lower the noise level in a discussion area, to be asked why, if the area was not silent.

One comment in particular draws attention to the level of unexpected use of facilities and a potential demonstration of environmental press. One member of staff observed a student studying in a flexible learning space, where there were empty desks with power points for laptops and desks with PCs, while another observed that desks with PCs built into them and converted to study desks were only ever used as computers. The student had unplugged a PC and moved the keyboard and mouse out of the way so that they could plug in and use their laptop, rather than use the desk a few metres away from them.

Additionally there was a suggestion that if library staff needed to somehow instruct or provide guidance for how to use particular spaces or furniture, then the design of that area had been unsuccessful, or that if signage was needed to indicate a specific type of study area, then the furniture was inappropriately grouped. One member of staff was concerned that the messages being sent were mixed: “despite encouraging groups by installing sofas and round tables, we are actively discouraging groups because of misuse”. Overall, the reflective logs and feedback from staff, while productive, perhaps inevitably led to some level of expressions of concern over space use and design which was very personal to the individual, and primarily represented their own interpretation of what libraries should be.

Desk enquiries data demonstrated that the nature of queries varied slightly by subject (see Figure 1), but that most were IT related (1127 across all floors and all weeks), followed by directional enquiries (873) and subject enquiries (669). Subject enquiries could be considered primarily those requiring a qualified librarian to provide a solution or support.



**Figure 1: Number of and nature of enquiries across each subject team desk.**



### Student data

Data collection of occupancy numbers, while time consuming, was informative. Soft furnishings were comparatively unpopular, confirming staff observations, ranging between 4 and 31% occupancy. Computers work stations were highly used, but varied between 14 and 88% depending on the furniture used (e.g. short term use computers at high benches with high stools had low usage). Desks without computers were used between 12 and 52% of the time. It did not seem to matter whether the area was designated silent or quiet discussion in any occupancy popularity, other than with desks without computers, where silent areas were less popular, although this varied according to subject floor (for example one subject floor is very heavily arts based and saw slightly more use of desks without computers with very little variation).

The reception survey provided information about personal choices of space to supplement occupancy data. 311 questionnaires were issued, with 154 responses (49%). Surprisingly few people mentioned selecting spaces for a specific reason. The most common factor was computer availability at 45.5% (in comparison to 57.4% of students coming in to use a computer), but all other reasons factored at 70-80% as **not** playing a part in space selection. This includes seat availability, silent study, proximity of friends, group work and other reasons. Figure 2 shows how overall group preferences were comparative low, but still well used.

Area Type	Have used this area (%)	Favourite Area (%)
Silent	64.9	34.3
Group	53.6	26.5
Individual	79.6	39.2

**Figure 2: Reception survey – student space type preferences**

With regards to library resources, respondents were given the option to select as many resources as they wished. Most people visiting the library were here to use the internet (74.8%), with high numbers still visiting to use paper (57.6%) or e-resources (43.7%). 7.3% visited to use the Art, Design and Architecture Resource Centre (ADARC) on floor 3, which compared to the number of people who stated they visited floor 3 (15%), demonstrates a significant number of visits for that floor. 22.5% referred to library staff during their visit. Using Pearson's R correlation test also revealed a small number of moderate correlations (such as between selecting seating according to computer availability and going on the internet, and using the archives and the ADARC), and some weak correlations (including selecting spaces for computer availability and using paper resources).

Opportunistic sampling led to more in-depth qualitative information, allowing observations to be made while carrying out the survey which frequently brought out data that potentially would not have otherwise been collected. Data was categorised for each question into the nature of the space the student occupied i.e. flexible learning spaces, group study rooms and silent areas, and then further categorised into groupings according to the answers provided regarding the type of studying they were doing, the resources they were using if any, and what led them to select that space. Due to the timing of the survey, students were largely working on assessments including some final year projects, and their purpose was reflected in the data returned.

This survey demonstrated that they had simplistic goals such as finishing the section they were working on. They liked using particular spaces for specific convenience reasons, such as proximity to resources, although some did mention they chose the same area and desk where possible out of habit. The data demonstrated that frequently students did not consider their selection of space

outside of it being 'the place to go': when asked what that meant they had difficulty expressing why that was the case unless there was a practical reason. Students often reported working on a particular package on the computer but were observed booking plane tickets or shopping online. The survey also helped to bring out further data on the nature of their studying: whether they were working on an assessed piece or preparing for tutorials; working on creating a wiki or actively researching their subject area online for recent developments; their resource use, providing data on how they combined resources rather than using one resource type at a time. Data also demonstrated some students selecting spaces not related to their own subject area in order to fit their space preference (one example was an architecture student working in the music library).

Learning logs provided very little data. The method proved problematic in terms of engaging students with reliance on teaching staff issuing the learning logs leading to students being informed that the work was not marked, and not being provided with full instructions for completion. Students therefore did not engage with the log, and many respondents only submitted partially or poorly completed journals with very little reflective data in order to qualify for free USB sticks. No students submitted photographs to the blog, and did not appear to understand its purpose or connection to the logs.

The focus group unfortunately only led to one individual attendee, possibly due to lack of availability rewards for attendance, and so was utilised as a one to one interview to find out what the student particularly liked about the library, what was useful, and what didn't work. While the amount of data from the interview was very specific to that one individual, the lack of other attendees encouraged free discussion and the student appeared to feel relaxed and comfortable, openly discussing what they viewed as negative design elements.

## **Conclusion**

The amount of data gathered was sufficient to demonstrate the methods selected were appropriate for measuring student engagement with space and staff, and similarly what kind of impact learner use had on staff. However, it is recommended that for full exploration of student interpretation of space, a reflective log or journal be incorporated into teaching in some form in order to engage and encourage participation, and that researchers be actively involved in classes using the logs to ensure instructions and research value are communicated effectively.

In terms of utilising the data itself, several recommendations were made with regards to improving student access to basic subject and IT support while ensuring qualified staff are called on as appropriate. The Director of Computing and Library Services led a initiative that places a greater emphasis on students being trained and made clearly available to support other students on the floor where help is needed: while the initiative is not directly related to the research itself the use of students for support has already reduced the number of basic enquiries reaching the desk and has had generated positive feedback. It was noted that in some cases staff feedback demonstrated that they perceived occasional student use of library space for social learning as inappropriate. However, personal opinions of staff of this nature were considered supportive of the constructive nature of the research in order to develop an understanding of staff impact in library use: all perceptions were a valid way of representing the impact made on staff working in that environment. Some library spaces have since been reconfigured/rebranded to make their purpose clearer, and a text messaging service has been introduced to allow students to contact staff if they feel behaviour in the area they are working in is becoming too rowdy. The scheme allows library users to police their own environments anonymously, while aiding staff to assess whether behaviour is perceived by the inhabitants to be disruptive or background noise.

More research would be required to examine to what extent student/staff interactions apply to other institutions. From the perspective of a single institution the project provided both a method to examine space use for any refurbishment in the future, and information on how to modify services to both reflect student needs and ensure appropriate staff are accessible at point of contact. The student data, due to the time limitations of the project, only allowed a comparatively small amount of collection, with no opportunity to modify methods/dissemination of the method to participating staff and re-run the diary element of the research. There may also be scope to include ethnographic observation and action research methods (i.e. manipulation of space configuration and observe any changes in use or interpretation of the areas, with regular student feedback and involvement); the addition of these methods may give further insight into the elements Könings et al. discuss in their research in terms of student interpretation and environmental press.

Further research is currently being planned by the author on a cross-university basis to create a firmer understanding the student data drawn from the methods and measure whether responses to space are similar in different institutions.

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### **References**

- Aspden, E.J. and Thorpe, L.P. (2009), "'Where Do You Learn?': Tweeting to Inform Learning Space Development", *EDUCAUSE Quarterly*, Vol. 32 No. 1, available at: <http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/WhereDoYouLearnTweetingtoInfor/163852> (accessed 3 March 2011).
- Bernardi, N. (2006), "Environmental Comfort in School Buildings: A Case Study of Awareness and Participation of Users", *Environment and Behavior*, Vol. 38 No. 2, pp. 155-172.
- Bryant, J., Matthews, G. and Walton, G. (2009), "Academic libraries and social and learning space: A case study of Loughborough University Library, UK", *Journal of Librarianship and Information Science*, Vol. 41 No. 1, pp. 7-18.
- Foster, N. F. and Gibbons, S., eds. (2007), *Studying Students: The Undergraduate Research Project*, Association of College and Research Libraries, Chicago, available at: [http://www.ala.org/ala/mgrps/divs/acrl/publications/digital/Foster-Gibbons\\_cmpd.pdf](http://www.ala.org/ala/mgrps/divs/acrl/publications/digital/Foster-Gibbons_cmpd.pdf) (accessed 29 April 2011)
- Gallagher, W. (1994), *The Power of Place: How Our Surroundings Shape Our Thoughts, Emotions and Actions*, HarperPerennial, New York, NY.
- Haug, J.C. (2008), "Learning Curve: Adapting Library Workspaces", *EDUCAUSE Quarterly*, Vol. 31 No. 4, pp.70-74.
- HEFCE (2006), *Guide to Post Occupancy Evaluation*, available at: [www.smg.ac.uk/documents/POEBrochureFinal06.pdf](http://www.smg.ac.uk/documents/POEBrochureFinal06.pdf) (accessed 10 March 2011).
- IFLA (2007), *IFLA Library Building Guidelines: Developments and Reflections*, K. G. Saur, München.
- Jensen, E. (2005), *Teaching with the Brain in Mind*, Association for Supervision and Curriculum Development, Alexandria, VA.

- JISC (2006a), *Designing Spaces for Effective Learning: a guide to 21st century learning space design*, available at: <http://www.jisc.ac.uk/media/documents/publications/learningspaces.pdf> (accessed 10 March 2011).
- JISC (2006b). *Designing Spaces for Effective Learning: a guide to 21st century learning space design* (toolkit), available at: <http://www.jiscinfonet.ac.uk/infokits/learning-space-design/evaluation> (accessed 10 March 2011).
- Könings, K.D., Brand-Gruwel, S. and van Merriënboer, J.J.G. (2005), "Towards more powerful learning environments through combining the perspectives of designers, teachers, and students", *The British journal of educational psychology*, Vol. 75 Pt. 4, pp. 645-60.
- Leung, M. and Fung, I. (2005), "Enhancement of classroom facilities of primary schools and its impact on learning behaviors of students", *Facilities*, Vol. 23 No. 13/14, pp. 585-594.
- Scott-Webber, L. (2004), *IN SYNC: ENVIRONMENTAL BEHAVIOUR RESEARCH AND THE DESIGN OF LEARNING SPACES*, Society for College and University Planning, Michigan.
- Space Management Group (2006) *Space Management Group report 2006/10, Impact on Space of Future Changes in Higher Education*, available at: [www.smg.ac.uk/documents/FutureChangesInHE.pdf](http://www.smg.ac.uk/documents/FutureChangesInHE.pdf) (accessed 7 March 2011).
- Strange, C. C. and Banning, J. H. (2001), *Educating by Design: Creating Campus Learning Environments that Work*, Jossey-Bass, San Francisco.
- Stuart, C. (2008), *ARL Learning Space Pre-Programming Tool Kit*, Association of Research Libraries, available at: <http://www.arl.org/bm~doc/planning-a-learning-space-tool-kit.pdf> (accessed 3 March 2011).
- Temple, P. (2008), "Learning spaces in higher education: an under-researched topic", *London Review of Education*, Vol. 6 No. 3, pp.229-241.
- Tibúrcio, T. and Finch, E.F. (2005), "The impact of an intelligent classroom on pupils' interactive behaviour", *Facilities*, Vol. 23 No. 5/6, pp. 262-278.
- Tom, J.S.C., Voss, K. and Scheetz, C. (2008), "The Space is the Message: First Assessment of a Learning Studio", *EDUCAUSE Quarterly*, Vol. 31 No. 2, available at: <http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/TheSpaceIsTheMessageFirstAsses/162874> (accessed 3 March 2011).
- Walton, G. (2006), "Learners' Demands and Expectations for Space in a University Library: Outcomes from a Survey at Loughborough University", *New Review of Academic Librarianship* Vol. 12 No. 2, pp. 133-49
- Weaver, M. (Ed.), (2008), *Transformative Learning Support Models in Higher Education: educating the whole student*, Facet Publishing, London.
- Whiteside, A. et al. (2009), "Using the PAIR-up Model to Evaluate Active Learning Spaces", *EDUCAUSE Quarterly*, Vol. 32 No. 1, available at: <http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/UsingthePAIRupModeltoEvaluateA/163845> (accessed 3 March 2011).
- Zhang, Y. and Barrett, P. (2010), "Findings from a post-occupancy evaluation in the UK primary schools sector", *Facilities*, Vol. 28 No. 13/14, pp. 641-656.

## Appendix 1: Email sent to staff

Dear all

As some of you are aware, a project is currently running to investigate what kind of impact our library space has on learning, as well as how this will affect support provided to library users. As staff provide learner support in a wide range of ways, this means you are as important to this project as the library users. In fact, as a member of staff you are a library user too!

We'd like you to participate by providing your thoughts on our space. No observation or comment is too small or too big! If a student has commented to you about something, feel free to pass that on, or if it is something you have noticed yourself moving round the floors, mention that too! Your feedback can be based on the old or new design (but please specify which), or a comparison between the two. **It is important we get your feelings on how the library was used before it was refurbished too.** Maybe you want to:

- comment on furniture, colour, temperature or lighting;
- tell us about someone using an area in a way you didn't expect, or don't think it is meant to be used for;
- make a suggestion based on what you've seen;
- comment on an area that could be used differently;
- describe how being in an area makes you or others feel uncomfortable or comfortable, physically or mentally
- make a basic observation or description without personal comment;
- ask questions about why students might behave in a certain way in certain areas.

Anything you have to say is very welcome, regardless of how personal or general, how positive or negative.

You can submit whatever you want to us, however you choose, but here are some guidelines and ideas to help you in your submission. Keep it straightforward – don't just submit complaints or compliments, give us details and/or ideas for making things work differently or why things might be happening that way. You can use whatever format you choose, with or without headings and the use of images, or you could write a diary – whatever you feel is best for you.

Please be prepared to clarify anything you submit later on. We will not be critical of what you have contributed, but might just want to know more about what you've suggested or noticed, or check what you meant.

Send your comments and thoughts (and any questions) to me by **August the 31<sup>st</sup>**, but please feel free to **send any initial or immediate thoughts to me right now**. This survey will inform us on the format of surveying we will use later in the project, as we will require observations of student use in the new term, so we really appreciate your support and help!

## Appendix 2: Student reception survey

### Learning Spaces in the Library: User Feedback Questionnaire November 2009

The library has been refurbished over a period of 3 years, and was completed this summer.

We'd like to know what you think of the environment, and how useful you find the different spaces. It should only take a few minutes to answer the questions.

1. Where were you working in the library today (e.g. which floor, using a computer, using a desk)?

2. Why did you pick that area? Tick all that apply.

- |                       |                          |                   |                          |                        |                          |
|-----------------------|--------------------------|-------------------|--------------------------|------------------------|--------------------------|
| Seat availability     | <input type="checkbox"/> | Silent study      | <input type="checkbox"/> | Group work             | <input type="checkbox"/> |
| Computer availability | <input type="checkbox"/> | Friends sat there | <input type="checkbox"/> | Other (please specify) |                          |
- 

3. Do you ever use any of the following types of study space on other visits to the library? If so, which is your favourite? Tick all that apply.

	Yes	No	Favourite
Silent Study	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Group Study	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Individual Study	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Why is the type of space you selected your favourite?

4. What were you doing in the library today (e.g. researching/writing/typing up an assignment, email, Facebook, meeting friends)?

5. What kind of resources did you use, if any? Tick all that apply.

Library e-resources

Trend Hub

Paper books/journals

Archives

Internet e.g. Google,  
Facebook

AV materials (DVDs,  
audio CDs, cameras etc.)

Library staff

Other (please specify)

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6. What made you choose to use the library over other areas around campus?

7. Anything else you'd like to say about the new library environment?