

Chapter 6

Space: Changing the Boundaries

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1 Introduction

This chapter considers developments in collaborative approaches to the enhancement of academic library space.

Brophy (2005, 216) defined the purpose of the academic library:

‘Academic libraries are here to enable and enhance learning in all its forms - whether it be the learning of a first year undergraduate coming to terms with what is meant by higher education or the learning of a Nobel Prize winning scientist seeking to push forwards the frontiers of her discipline’.

These developments are first viewed in the context of changes in higher education, learning and teaching and technology. The second section considers examples of collaborative approaches and the final section of the chapter attempts to evaluate these developments in terms of learning enhancement, rather than of space efficiency. While it is crucial to integrate physical and virtual learning spaces, this chapter will focus on physical library spaces.

2 Context

Developments in learning space design methodologies are driven by and impacted upon by changes in the higher education sector, by approaches to learning and teaching and by developments in technology and these are considered briefly here.

2.1 Higher education, learning and teaching

A key element of institutional policies in the UK and elsewhere, has been the emphasis on active learning and the development of students as independent lifelong learners. More recently this has been supplemented by issues such as personalisation and ownership of learning as outlined in Higher Education in a Web 2.0 World (Committee of Inquiry into the Changing Learner Experience, CLEX, 2009).

In the UK ‘enhancing the student experience’ is a key focus of funding councils, the Quality Assurance Agency and the Higher Education Academy as mentioned in Chapter 5. The Ramsden report (2008) highlighted the importance of students as partners in developing their own learning experience which is a ‘joint responsibility’ between them and their institution. In many universities students are now involved in formal and informal decision making and planning.

Changes in the higher education sector, including the expansion of a fees culture (Department for Business, Innovation and Skills, 2011) and the National Student Survey and

other surveys have resulted in differentiation in the marketplace. Universities will have to be clear about their complete offer to students as they try to attract fee paying students as customers and to manage the different perception held by students of themselves as learners and as consumers / customers.

Therefore institutions need to take a holistic view of learning and the student experience. The development of collaborative approaches across institutions has reflected this in the UK both in terms of 'super-convergence' of university services such as libraries, student services and registry (see Chapter 9) and in terms of joint initiatives, such as 'one stop shop' approaches to information points for students, even where such services remain organizationally separate. In the US the Learning Reconsidered (Keeling, 2004) paper articulates that the student learning experience is not merely classroom based and involves cross-institutional collaboration.

Current higher education learning and teaching practice reflects post industrial society with changes in pedagogy and a shift towards constructivist models in a post industrialist age. Light and Cox (2001, 18) note that this is almost a 'secular religion' in the sector and while different theorists differ on whether they stress the importance of biological and cognitive mechanisms (Piaget) or social factors (Vygotsky, Lave) there is general agreement that knowledge is constructed by learners based upon their current/past knowledge and experiences and has resulted in the incorporation of collaborative approaches to learning in curriculum delivery.

2.2 Technology

From their research in Canada, Doiron and Asselin (2010, 230) note that 'In many cases we seem to have been tinkering [with technologies] to make them fit into the traditions and values long held for tertiary education. This will not get us to where we need to be if we are to be relevant and robust learning communities'.

In the UK the Committee of Inquiry into the Changing Learner Experience (op.cit.) was convened in acknowledgement of the critical impact of technology on higher education. Its aim was to enquire into 'the strategic and policy implications for higher education of the changing experience and expectations of learners in the light of their increasing use of the newest technologies'. It noted that the current generation of student are managing a disjuncture between their world and that of higher education – and that future generations will not be so accommodating (CLEX, 2009, 5,7).

In the US Oblinger and Oblinger (2005, 2.9-2.10) identify this generation as the 'Net Generation', (also called 'Millenials' by Rowlands and Nicolas, 2008 and 'Digital Natives' by Prensky, 2001) and for them 'the Internet is like oxygen; they can't imagine being able to live without it...What we might consider new technology such as blogs or wikis are not thought of as technology by students'. However, the Net Generation are not satisfied with web-only courses, they have certain expectations about higher education in addition to their desire to be connected with people and to be social. It is the way that they do this that is different. But students still come to college to meet people, to socialize and to engage with faculty. Oblinger and Oblinger recommend that institutions engage in dialogue with learners before investing in technology or buildings rather than relying on past assumptions.

McLaughlin and Mills (2008, 3) list the key changes in learning and teaching in Australian Universities over the past two decades in terms of technology, learning models, communities of learning, professional learning, third space learning and non-sequential learning. They note that developing learning spaces to enable these trends is paramount to the future of institutions.

The next section considers how these contextual developments have influenced library space design and the emergence of collaborative approaches.

3 Libraries and space development

Given the above complexity, library services and spaces need to be more closely aligned with mission and strategic priorities of their institutions. Library space planning is becoming, and needs to continue to become, an institution wide collaborative activity.

Although for a time it seemed that technology would negate the need for on-campus library services, in the past twenty years or so there has been a sea change in thinking about university libraries as learning spaces together with the acceptance that PCs could be more than tools for individual learning. The widespread adoption of technology to enable and support learning would need new types of spaces for learning. Indeed as Freeman (2005, 2) and others argued, technology has actually become the catalyst that 'transforms the library into a more vital and critical intellectual centre of life at colleges and universities'. The UK Joint Information Systems Committee (JISC) Designing Spaces for Effective Learning project (2006) looked at how learning and teaching spaces across institutions, including libraries, should develop to effectively enable technology enhanced learning. One of its key findings was that for success an integrated approach was necessary, including the involvement of collaborative teams (estates/facilities, library and ICT senior managers) in development projects. These also need to include a shared understanding of vision and goals between architects and institutions (ibid, 13).

Hunter, Lidgy and Roberts (2005) further analysed the work of this project and found that there were two key drivers required for the effective development and implementation of new types of learning spaces. Operational drivers originated in factors affecting organizational effectiveness while pedagogic drivers affected the learning and teaching experience of students and arose from institutional strategies and course delivery methods. Without both these drivers present projects were unlikely to be successful. And without pedagogy as the main driver 'institutions may simply replace like with like' (ibid., 5). They re-iterate the importance of collaborative approaches to space development involving academic and professional support services staff from across the institution. According to their study, students were not then seen as having any direct input into the management or development of learning spaces in top level committee by institutions consulted but Hunter, Lidgy and Roberts note that they are key to the development process.

Today there is an acknowledgement of the importance of putting the learner at the centre of what we do. Libraries are moving from being collection centred to being student centred, away from being as Freeman (2005, 1) notes 'first and foremost as places to collect, access and preserve print collections' and away from having a large amount of space devoted to library operations. Initial changes were driven by changes in technology in terms of access to collections. Now there are moves to technology as an enabler and with a focus on learning. This has also been enabled with developments in collections management (such as shelf ready book supply, electronic resources provision) which enable library space to be freed up (see, for example, Lewis below).

3.1 Collaborative design of library and learning spaces

If we put the learner at the centre of our developments then, as Malcolm Brown (2005) has argued, learning theory should inform all other decisions about learning space design within

our institutions and a vision for learning spaces should be underpinned by this. Design of spaces should also include students.

'Learning space design requires a collaborative, integrated approach with an overarching vision that informs and support specific projects' (ibid., 2.2).

Eigenbrodt (2008, 14) believes that Hannah Arendt's model of the public sphere can be adapted to the development of academic libraries. Societal space will enable people to come together to develop. They can be places which can bring people together, spaces 'which allow users to discover and configure the space for themselves' without preventing seclusion in quieter areas.

Gayton (2008, 64, 60) attempts to clarify the difference between communal and social learning and issue in design. He argues that communal activity in academic libraries is 'a solitary activity; it is studious contemplative, and quiet' as opposed to 'social activity which is group activity...it is certainly not quiet'. Gayton quotes Ranseen (2002) who had already noted that 'communal study in a library foster a silent exchange of energy and quiet study is in truth an active experience. Gayton further argues that social learning spaces should not undermine the 'fundamentally communal character' of the academic library.

What these ideas illustrate is the importance of retaining traditional aspects of library spaces and for these not becoming an afterthought in design. The relationship between library and learning environments, collaborative practice and the resulting configuration of space is next explored, with notable examples.

3.1.1 Library design continuum

It is important that we view library space within our institutions as a continuum from completely silent to completely social and that we offer a range of spaces on this continuum for our communities to suit different individuals and also the same individual at different times - it may well be that the same person who is the life and soul of the social areas at the beginning of the academic year is the mainstay of the silent areas at the end. In its 2012 refurbishment, for example, Teesside University in the UK is combining the introduction of social learning spaces with the creation, for the first time, of a discrete silent study area by partitioning off a formerly open atrium on one floor. Sunderland University (UK) has the Catherine Cookson Reading Room, a silent space (University of Sunderland, n.d.) and the Information Commons at UK's Sheffield University, has a silent study area as part of its provision of a variety of spaces. Both these spaces certainly encourage communal learning and would also seem to embody Frischer's (2005, 50) 'drama of community'.

I would argue that we should adapt our traditional model of library services of 'space, resources and staff (who deliver services and support)' to one of 'space, technology (including access and resources) and pedagogy'. This would fully reflect institutional priorities and enable the library and information profession in higher education to embed its service and space development within the broader context of developments within the sector.

3.1.2 Library as facilitator of learning

Nitecki (2009, 31) states library space still has three main functions, whether these are the core mission or merely co-existing roles. The role of space as:

- accumulator (resources and equipment)
- service provider (interrogation retrieval, circulation of materials and customer support) and

- facilitator (through the design of environments for autonomous learning and knowledge creation).

Many would argue that it is the facilitation role which is key for the future of physical library space and the work of Kathlin Ray (2002) (cited by Nigtecki), would seem to bear this out. Ray's paradigms emphasise the change of library accentuated values over time: resources or holdings (before 1980); access (1980); use by students (1995); and learning transformation (predicted for 2010).

3.1.3 Library services: contemplative and collaborative

The Education Advisory Board of the (US) University Leadership Council (2011 63) has surveyed University librarians to find the 'top trends in next generation library space planning'. These are:

- fewer physical resources
- comfort and collaboration
- flexibility and modularity
- wireless connectivity and outlet access
- integration of academic support services and food and drink.

These would seem to mirror planning considerations already in operation which reflect broader changes in the higher education landscape. Libraries have had to develop spaces to support a broader range of learning activities and styles, course delivery modes and attendance patterns.

The first example of this, and for many still the most radical interpretation in the UK is the Saltire Centre at Glasgow Caledonian University. Much has been written of this development which attempts to put the building at the centre of the campus and the learner at the centre of the development in creating a campus learning hub. The building was the result of cross institutional collaboration between students, library, student services, and estates professionals as well as learning and teaching specialists in the design period and the operation and delivery of services reflect an ongoing partnership between these services and students. The Principal viewed the Saltire Centre as 'an overt strategy to re-socialize the University and encourage conversation between students and staff that engage the whole community as co-learners, exposing their understanding and ideas to those of others. It is this questioning and dialogue that lead to deep understanding of concepts and ideas' (JISC Infonet, 2012).

3.1.4 Integrated learning environments

The Information Commons (IC) movement was particularly significant in its attempt to integrate library and learning provision with the broader student learning experience independent of organisational structure. Early adopters included University of Calgary, University of Auckland, University of Iowa and University of Southern California. As the emphasis on learning underpinned by technology rather than technology as an end in itself has regained ground, this has been reflected in the name of these developments with 'Learning Commons' (LC) gaining in popularity.

Beagle (2010, 14) notes how the physical spaces in an Information /Learning Commons are an expression of a learning support focussed approach. He cites research by Nagata (2009) of the link between IC / LC and the Japanese concept of Ba: 'shared space for emerging relationships'. The space can be physical, virtual, mental or any combination of them but is concerned with the concept of knowledge creation.

Increasingly the term Learning Commons has been used to differentiate spaces where a number of university services (in addition to library and IT departments) have come together to support students in a more collaborative and holistic way as reflected in the importance of student success and employability. These services may include academic writing, media, etc. but also curriculum development. Libraries have been developed as 'an integrated learning environment' (University of Auckland, n.d.) and that 'fosters informal, collaborative and creative work, and social interaction' (University of Massachusetts Amherst, n.d.).

In the UK the Commons name has most notably been taken up by two institutions from the Russell Group of research led institutions. The University of Sheffield has integrated its undergraduate library into its Information Commons. Development of this space and support within it has involved collaboration between the University Library and University IT services, two operationally distinct services with a single manager as well as with the School of Information Sciences who manage the Centre for Inquiry-Based Learning in the Arts and Social Sciences (CILASS) space within the building (University of Sheffield, n.d.). The University of Manchester is developing a 'Learning Commons'. While managed by the John Rylands University Library it is in a separate building and aims to provide 'a world-class 21st century learning environment' (University of Manchester, n.d.). It is due to open in summer 2012.

As Bennett (2006, 17) noted 'a library fit for purpose cannot be designed around self-referential service concerns as libraries customarily are today. For libraries that are 'something more than traditional dressed as new' we must 'relax the dominance of traditional services in library planning, focus on the learning behaviours of readers and self consciously uses space to enable community based learning'. Bennett advocates embracing the virtual library as part of this new approach. Only the situating of information in the social context of learning can justify the immense investments made in new library space.

The content of some of these initiatives does not differ very much from what is already on offer in many academic libraries in the UK. However the importance of the cultural concept of the library being at the heart of the learning process is evident. This enables us to reclaim the idea of the university as community of learners with the library at its heart and presents significant opportunities for academic libraries within their institutions.

3.1.5 Student collaboration

The acknowledgement that the student experience is broader than just what happens in the lecture theatre and how this impacts on the library has further helped to focus institutions on the importance of libraries. This has been accompanied in the UK by the emergence of student engagement and the student voice as key issues in higher education and of the collaborative development of facilities and services as an important element of this (see, for example, Corbyn, 2012).

It is now usual (in the UK at least) for students to be members of space design and refurbishment project boards within universities or as a minimum, to have been consulted via focus groups or as advisors. In contrast at Fresno State University students have played a key role in the design of the refurbished University Library via ethnographic studies (as detailed below) and Twait (2009) has written about her experience of offering a course in theoretical design of a library as a third place.

The development of the new library at Macquarie University (Brodie, 2008) also involved developing strategies for student involvement in the design of learning spaces. Additional collaboration took place with some of the University's school partners as some final year students would become University undergraduates in the following academic year.

3.1.6 Leadership

Library services are increasingly seen as leaders in developing and managing learning spaces outside the library building. The following UK case studies demonstrate the extended and influential role of the library where space initiatives have enabled academic libraries to lead collaborative projects on behalf of their institutions.

The Learning Gateway at the University of Cumbria in the UK aims to be 'the home of flexible learning' on the Carlisle campus. 'It is an innovative, interactive and adaptable space that offers students, visitors and staff an exciting and diverse range of learning opportunities and experiences. It has embedded technology and wireless network throughout' (University of Cumbria, n.d.). The space is managed by Learning, Information and Student Services, the department including the library and student services. The space houses the Centre for the Development and Enhancement of Professional Practice in order to provide critical underpinning of the University's Learning and Teaching Strategy with the aim of supporting teaching staff development.

Teesside University Library and Information Services manages 'The Corner' a postgraduate learning space in the student union building catering for those who want a more informal but still serious study space.

Bradford University's Student Central is intended to offer social learning spaces, career oriented activities, self development and curriculum activities. The space includes social learning areas and a cafe, seminar rooms and a tiered lecture theatre with a 'learning mall' connecting with the library. The vision for the space was that it would 'work in synergy with the J.B.Priestley [University] Library as one learning environment', creating a 'fusion of space' (University of Bradford, 2011).

The University of Bolton's library has been part of a learning mall of student focussed services. Refurbished in 2011 as the Chancellors Mall this now includes the Social learning Zone: 'a more chilled out version of a library'. (University of Bolton, n.d.).

Exeter University's refurbished library is in the context of the development of a learning forum which aims to provide 'an inspirational range of learning facilities'. These include a new Student Services Centre, technology rich learning spaces, a 400 seat auditorium, retail and catering outlets and the University reception. The building opened in May 2012. The University's registrar David Allen has stated that:

'What is absolutely essential is that it works for the students. It needs to be flexible so that if future needs change the buildings can be easily adjusted to suit, and flexible so that spaces can potentially be used for a range of activity'. (University of Exeter, n.d.).

Portsmouth's 'Third Space' aims to be students' 'home from home' on campus. It was inspired by elements of the Saltire Centre, mentioned previously. It offers social learning spaces and access to student union facilities in an alcohol free environment. It is part of a clear University strategy to offer a variety of learning spaces on campus, including traditional library space and library open access computing, as well as facilities for 'student led' activities. (University of Portsmouth, n.d.).

Within the library space envelope De Montfort University has developed the Learning Zone in partnership with the Centre for Learning and Study Support which is now organizationally within the same department as the Library. Towson and Pillai (2008, 25) note the importance of the library as a hub of independent learning and believe that the co-location of library IT and student support services has led to an increase in student use of available

support services. Teesside University library has for many years managed the University's Drop in Student Skills Centre which is housed within the University library building. The service was reviewed in 2011 and as a consequence of the review and of the partial refurbishment of the Library, the new Learning Hub will be a core element of the University's work on integrating independent learning and skills development. The project will connect 'spokes' in the University's academic schools, with other support services and with the Student Union.

3.1.7 Institutional view of library learning spaces

The institutional development of learning spaces and their impact on students' learning development was an aim of the (UK) Learn Higher Centre for Excellence in Learning and Teaching (CETL) (Learn Higher CETL 2010). The CETL, a consortium of ten institutions of from different mission groups had the intention of enabling diverse learners to achieve their maximum potential. As part of the project libraries at Liverpool University and Kent Medway campus developed new learning spaces.

Research undertaken at Bradford University as part of the Higher Education Retention and Engagement Project (Lefebvre, 2011) found that various aspects of the student experience influenced the retention and engagement of students. Of these 'belonging' was associated not only with belonging to other people and the course and department but also to the wider campus and university, and the importance of spaces, both physical and virtual was emphasised. The project examined the issue of belonging in relation to physical space on campus via open-ended survey responses and interviews. Flexibility of space correlated with popularity: 'The most popular places, however, emerged were those which offered multiple resources or usage – so spaces where they could meet friends, socialise and eat, but also study and do group work' (ibid., 4). These multiple use spaces were important, as were places designated for quiet study and privacy or relaxation.

Is the natural end of these collaborations the end of library space? David Lewis, in his article 'A strategy for library services in the 21st Century' (Lewis, 2007) suggests that the natural consequences of digitization of existing stock and purchase of new electronic resources is that space will be made available for learning. However 'Library space will need to be shared with a variety of partners, and it is likely that the distinction between the library and other informal campus space will blur'. He argues for 'campus conversations' to determine future form and function of library space and that giving space back to the institution will be a natural consequence of this (ibid., 423).

Keating and Gabb's 'Principles of learning commons' (2005) reflect both the move from service to learner as noted by Bennett (2006) (op.cit.) and also a move to a broader, institution-wide strategic approach based on collaboration and responsiveness to changing needs. A further development of this approach has been demonstrated in the collaborative design implemented at California Polytechnic State University and further developed by San Jose State University (written about elsewhere in this volume). Somerville and Collins (2008) write about the application of this approach at both institutions and how the elements: a process (user centric, interdisciplinary continuous investigations), an outcome (usable products, applications, environments and a philosophy (learning focus and relationship building) develop an inherent learning orientation to space and service development.

3.1.8 Collaboration with faculty

While new technology enabled learning spaces may improve student *satisfaction* with facilities at their institution, Lippincott (2009) notes that the integration of spaces, technology and curriculum is key to improvements in student learning. However, this is unlikely to happen without the engagement of teaching staff from the beginning of any such project. In

specialized spaces the learning requirements of the disciplines need to drive the planning process. She quotes the Project Kaleidoscope organisation in the US which has created resources for space planning and engagement with academic staff. Central to this is the opportunity afforded by linking space to 'insights about how people learn, which needs them to translate into curricular reform...illustrat[ing] the inter-relationship between curriculum, spaces and goals for student learning' (ibid., 18). Lippincott (2006) cites learning and information commons as success stories of collaboration between academic and support departments. This can be true whether the facilities have been developed as an integral part of library building or are separate to the university library building even when 'owned' by the library department.

The JISC Learning Landscapes in Higher Education project (Neary et al., 2010) looked at collaborative developments in learning spaces across a several institutions from different mission groups. The project aimed to 'make a very clear connection between research into effective teaching and the design of learning spaces, as well as demonstrating how to establish a relationship between design and pedagogical theory' (ibid., 11). Findings included that the engagement of students and staff (academic and support), pedagogy as a design principle and alignment of design with institutional priorities were all key elements of successful landscape design.

The issue of staff learning and development in relation to enabling effective learning in new kinds of spaces was mentioned by Lippincott (2009) and Wilson and Randall (2012) and is the focus of current JISC projects regarding digital literacies (JISC, n.d.). It is obviously pertinent to academic staff delivering learning and is also a key consideration in terms of the learning facilitation and support offered by library staff in library spaces.

The final section reviews attempts to evaluate the effectiveness of libraries as learning spaces and their contribution to students' learning.

4 Effectiveness of libraries as learning spaces

So how do we assess whether these developments have enhanced students' experience and contributed to improving their learning?

The UK Higher Education Space Management Group reviewed the impact of developments in spaces in the UK sector in terms of more efficient space utilisation (UKSMG, 2008). However, it is important for evaluation not to focus solely on this aspect.

While the higher education sector in the UK as a whole, as mentioned elsewhere is moving towards a more student centred focus, Bligh and Pearshouse (2011) at the University of Nottingham noted that evaluation of learning spaces in general still comes from a perspective of spatial determinism and a focus on the space rather than the learning. Evaluation needs to acknowledge learning as a cognitive experience.

The JISC 'Study of Effective Evaluation Models and Practices for Technology Supported Physical Learning Spaces' project (JELS) project (Pearshouse et al., 2009) aimed to identify and review the tools, methods and frameworks used to evaluate technology supported or enhanced physical learning spaces. The final report identified a need for higher education sector 'to reconsider how to evaluate physical learning spaces, so as to more clearly assess how they satisfy design intentions and teaching and learning needs' (ibid., 4) and proposed a conceptual Framework for Evaluating Learning Spaces (FELS).

In the US there is evidence of further development of evaluation methodologies. Dayton University has been concerned with developing an institution-wide approach to the assessment of learning and teaching spaces. A multi-year study was commenced in 2004 with a rationale based on links between spaces, pedagogy and the academic programme. In the middle of the project it emerged that student engagement was the best measure for learning as assessing specific learning outcomes was too complex. Hunley and Schaller (2009, 6) note in this context that without assessment institutions may miss the important connections between context, institutional culture and students' specific needs'.

Radcliffe (2008) has developed the Pedagogy-Space-Technology (PST) Design and Evaluation Framework. Key questions for evaluating learning spaces are framed within each of these areas. Wilson and Randall (op.cit.) have used this methodology to evaluate 'next generation learning spaces' at Bond University in Australia. These spaces were influenced by the Australian Learning and Teaching Council's Next Generation Learning Spaces Project. They used observation, focussed interviews and surveys of staff and students and concluded that further investigation is needed in areas of learner interactivity, learner engagement, use of technologies (by both staff and students), impact of furniture and discipline specific approaches to use of the space.

As a profession we have perhaps been guilty in the past of assuming that we know what is best for our students. Evaluation of the effectiveness of our learning spaces has been an area for development. The JISC Library Impact Data Project (2011), discussed in depth in Chapter 7, found that there was no correlation between *visits* to the library and degree class. However, information from recent refurbishments, for example at Northumbria University suggests that if the space is more relevant to students they will visit more often and stay for longer.

Roberts and Weaver (2006) argued that rigorous evaluation studies must be underpinned by sound theoretical frameworks in order to understand the complexities of the student experience in blended learning environments.

In the US the authors of the Library Study at Fresno State University contended that the design of library services and spaces would benefit from the ethnographic study of its students. (Delcore, Mullooly and Scroggins, 2009). The study was informed by ethnographic studies of the student experience at the University of Rochester (Foster and Gibbons, 2007). The Fresno State work is interesting in that the issues facing the university, in terms of ethnicity, class and retention as well as off-campus residency would be recognised by many institutions elsewhere. The need for the library to fit into the broader demands of student life as well as campus life was a key consideration. The study was an example in collaboration from across professional backgrounds and also attempted to 'illuminate the texture, rhythm and experience of university student life in general' (op.cit.,5).

In the UK Fraser (2009) analysed the impact of the Information Commons using a theory of change model including ethnographic interviews. The analysis captured students' own explanations for their behaviour, which indicated how far their use of space was influenced by the design of the Information Commons. Bryant, Matthews and Walton (2009) used ethnographic methodologies at Loughborough University to assess the effectiveness of the new 'Open' space in the main University library. The space was 'designed to provide library users with somewhere they could engage in individual or group activity...it is the only areas where users can study but are also permitted to chat, eat and drink' (ibid.,10). The study was small scale and did not have the aim of linking library use with learner success and learning outcomes. However it garnered useful findings for incorporation into library service development and was helpful in assessing how far the building has met its design aims and objectives.

One of the Fresno findings relating to space is that future marketing efforts should focus on the diversity of learning spaces. This resonates with findings elsewhere – in the UK, there is a reported swing back to a demand for traditional library spaces from academic library directors in addition to a continuing demand for group and social learning spaces. What current students mean by traditional spaces may well be different from library staff interpretation and again assumptions about separation from technology in silent spaces may not always be appropriate.

Illinois State University used student led ethnographic research. (Hunter and Ward, 2011) to assess developments in the University's Milner Library. The work started as collaboration between an anthropologist (Hunter) and a librarian (Ward). Ethnography was considered to be an appropriate methodology because students may initially be unaware of how they study or share the same vocabulary as librarians and 'ethnographic methods are useful for capturing the largely unconscious cultural beliefs and practices'. The project tapped into students' native expertise and their easy rapport with peers. One interesting finding was that some students continue to come to the library to find quiet or less distraction. 'Students choose to study in the library because it allows access to all of those services while offering quiet spaces free of distraction'. (ibid., 267)

An initial assessment of a 'Learning Studio' at the University of Missouri-St Louis has been described by Tom, Voss and Scheetz (2008). One of the drivers for the development of the space is mentioned as competitiveness, as well as the need to meet the requirements of an accrediting body for linking continuous improvement and student learning outcomes. An attempt was made to gather qualitative and quantitative data during one semester and methods used included staff observation of student behaviour, video observations, surveys, and staff debriefing meetings. Obviously more flexible use of space, including changes to PC layout and wireless connectivity will impact on usage density and Tom, Voss and Scheetz note that 'An institutional debate should address the potentially competing goals of effective learning versus the efficient use of facilities'(ibid.,50).

I would argue that the debate is really about what effective use of learning space, including libraries, really means.

5. Conclusions

Library spaces have transformed in recent years in response to changes in the broader higher education sector, in technological developments and in learning, teaching and learner behaviour. As described in this chapter, the provision of technology rich environments, integrating the physical and the virtual, and use of flexible spaces are key elements of these developments. The importance of space in the library as an enabler and facilitator in learning cannot be underestimated and it is crucial that librarians play a key role in the debate and ensure that our spaces remain aligned to the institutional mission and be relevant to the student learning experience. Relationships that underpin space design for learning and teaching in the 21st century are increasingly complex and librarians need to work collaboratively with students and with academic and professional services leaders across the changing boundaries of their institutions to develop a full understanding of the impact of new spaces and to articulate clearly and strategically the importance of the library space to the institution.

If the central purpose of the academic library is concerned with learning, as Brophy (op.cit.) stated, then librarians need to ensure that we take a collaborative, holistic and strategic approach to ensure that we deliver the most effective library spaces possible for the benefit of our learning communities.

'It is by realigning libraries with institutional mission that the paradigm for the future will be found' Bennett (2005, 23)

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