Library Space Assessment: A Review and Professional Education Case Study

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ABSTRACT
Purpose. The research aimed to review the current state of library space assessment, and to investigate how new professionals, represented by a cohort of graduate students taking a course on academic libraries, approached the task of designing and conducting a one-shot space evaluation project.
Design/methodology/approach. A review of literature on academic library space was used to introduce the project to student participants and to put the results of their work in context. Seven student groups were required to define their evaluation criteria, conduct quality assessments at individual sites, and perform a cross-case analysis to inform recommendations for improvements.
Findings. The literature confirmed growing interest in learning space assessment, with a trend towards use of mixed (quantitative and qualitative) methods, particularly ethnographic techniques using multimedia, and the development of comprehensive toolkits and frameworks. The students used a range of approaches: three groups developed their own evaluation criteria or categories (informed by their reading), and four groups used existing tools (with modifications). All used observation to collect data. Variations across the cohort pointed to different priorities in professional and/or personal values.
Research limitations/implications. The research was based on a small sample of 20 students in one cohort. Replication of the study with future cohorts tasked with the same assignment would strengthen the validity of the findings.
Originality/value. The study offers a novel perspective on the desirable qualities of learning spaces by exploring how graduate librarianship students as both student library users and next generation professionals specify evaluation criteria and conduct space assessments.
Keywords. Academic libraries, Evaluation frameworks, Learning spaces, Library assessment, Professional education, Service quality.

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INTRODUCTION

Higher education institutions around the world are making substantial investments in new and remodelled library spaces to meet the changing needs of learners and researchers in the dynamic digital world: Saunders (2015) found facilities, specifically physical space, was the second most popular strategic direction in US academic libraries planning documents, included in 60 of 63 plans reviewed; while Stewart (2015) reports 232 new academic library facilities projects completed in the US between 2000 and 2014. Similarly, in the (much smaller) UK tertiary education sector, Watson and Howden (2013, p. 6) report that "Despite the tough financial climate there have been many new library developments in the UK, particularly in the university sector, in recent years including refurbished and repurposed space as well as completely new buildings", which was confirmed by the *Designing Libraries* (2004-) database, which retrieved 78 records for new, converted, extended or refurbished building projects completed within the same 15-year timespan.

As the concept of library space as a service has gained momentum, academic library managers have recognized the need for additional tools and techniques to evaluate the quality of library space alongside other library assessment activities (Lippincott and Duckett, 2013; Nitecki, 2011; Stewart, 2011). Space assessment and evaluation efforts have evolved from routine counts and questions in general satisfaction surveys to more elaborate targeted qualitative methods, such as participant observation, filmed monologues, qualitative questionnaires, and design workshops, often involving students and other stakeholders as partners in the process (Bedwell and Banks, 2013; Cowan, 2012; Fox and Doshi, 2011; Garritano and Yatcilla, 2014).

The culture of assessment in higher education has made service evaluation, quality assessment, and performance measurement a strategic issue for libraries in the 21st century (ACRL Research Planning and Review Committee, 2012; Saunders, 2015; Town, 2011), which is reflected in the growth of international conferences and journals that focus on the subject (notably the Northumbria International Conference on Performance Measurement in Libraries and Information Services, the Evidence Based Library and Information Practice Conference, the Library Assessment Conference, and the journals, *Performance Measurement and Metrics* and *Evidence Based Library and Information Practice*), and the development of specialist positions as "assessment coordinators" or "assessment librarians" (Oakleaf, 2013; Passoneau and Erickson, 2014; Wright and White, 2007).

However, assessment and evaluation are no longer the preserve of senior managers and specialist staff, but increasingly recognized as a core competence for professionals working at every level and in all parts of libraries and information services. ALA's (2009, p. 5) *Core Competences of Librarianship* includes "The concepts behind, and methods for, assessment and evaluation of library services and their outcomes" as part of the expected knowledge base for all graduates of an accredited master's program in library and information studies, and the Canadian Association of Research Libraries (CARL, 2010, p. 7) similarly specifies Assessment and Evaluation as a core competency for 21st century librarians, while two recent texts for new academic librarians each devote a whole chapter to the subject (Crumpton and Bird, 2013, Moniz *et al.*, 2014), confirming the importance of giving MLIS students opportunity to learn about conducting assessment activities during their programs.

Our study sought to review the current state of the art of library space assessment, and to investigate how new information professionals, represented by a cohort of graduate students taking a course on academic libraries as part of a professional preparation master's program, approached the challenge of designing and conducting a "one-shot" space assessment project. A particular aim was to examine how the student-librarians framed their assessments and to compare their evaluation criteria and methods with practices described in the literature.

METHODOLOGY

The research used an exploratory qualitative collective case study design. A review of the literature on academic library space was a central component: findings from the review informed the content of the learning module and assignment instructions that introduced the subject matter to students, and the literature was also used to contextualize the results of their work, including the approaches chosen. The assignment submissions were assessed by the instructor during the term in accordance with the course schedule, and then reviewed at the end of term for the purpose of the case study. The key questions explored were:

- How do MLIS students frame their space assessments?
- What evaluation criteria do they choose and use?

The instructor monitored student progress through the different stages of the assignment, providing formative feedback as appropriate to ensure their projects were manageable, but taking care not to influence their basic approach.

Case description

There were 21 students registered for the course in the 2014-15 session, which included 15 attending weekly classes on campus and 6 accessing pre-recorded lectures and other resources online. Students were allocated to groups of three within the two course sections, and each group was tasked with conducting a multi-site comparative evaluation of library spaces in higher education institutions of their choice. They were asked to assess the fitness for purpose of their selected spaces in relation to the missions and values of the libraries and their parent institutions (concepts explored in week 3 of the course). In preparation for the assignment and the related lecture in week 4, the students were expected to read Lippincott and Duckett's (2013) article in *Research Library Issues* on connecting the assessment of library space to institutional goals for student learning, and Treadwell *et al.*'s (2012) account of the ethnographic methods used at a liberal arts campus to explore undergraduate and (post)graduate student preferences for library space in the context of a facilities redesign project.

The week 4 lecture provided an overview of the evolution of academic library spaces from book stacks and reading rooms to technology-rich commons environments, and a survey of established and emergent approaches to space assessment and evaluation, drawing on literature from both the library and education domains (Cunningham and Tabur, 2012; Daniels *et al.*, 2010; Germany, 2014; Line, 2002; McDonald, 2006; Nitecki, 2011; Schlipf, 2011; Wong, 2014). The week 4 reading list included additional reviews, case studies, and viewpoints to supplement the lecture references and support student research for the first stage of the assignment. The intention here was not to cover the topic comprehensively, but to select examples illustrating the variety of quantitative and qualitative approaches found in the literature, ranging from evaluation checklists and frameworks to multi-method and participative designs.

To complement the lecture and provide a more explicit link between theory and practice, students were required to view three short (3-6 minute) video presentations of new/renovated library spaces, decide which space they felt worked best for learners at that institution, and post comments to the online discussion board for the course, identifying their preferred space and the facilities or features that made it a good place to study. They had to select from a set of eight YouTube videos, representing a range of institutional settings: Deusto University (2009), Grand Valley State University (2013), Johns Hopkins University (2013), North Carolina State University (2013), Ohio State University (2009), Portland State University (2013), Santa Clara University (2009) and the University of Edinburgh (2010). This exercise was intended to help them start thinking about desirable qualities of library spaces individually, before engaging in discussion of evaluation criteria within their groups.

The formal space assessment assignment was broken down into three stages, requiring submissions at intervals of two weeks, and designed to enable instructor feedback on stages 1 and 2 to inform the next stage of the project. (Staged submissions were introduced in 2014-15 following some missteps by the 2013-14 cohort, when errors and omissions in the first part of the project made it hard for groups to complete later components successfully.) A key requirement of the project was for each group to discuss and agree the evaluation criteria members would use for their individual assessments before visiting their chosen sites, to facilitate the cross-site comparisons they were to carry out for the final stage of the project.

For stage 1 they were expected to review relevant literature and adopt or adapt existing criteria or develop their own evaluation framework informed by their reading; they were also asked to name the library site that each group member had selected for assessment (to check they had chosen different spaces as required). For stage 2, they had to carry out individual site assessments and submit these separately for grading and feedback prior to sharing their reports for stage 3, where they were to perform a cross-case analysis to look for similarities and differences among the strengths and weaknesses, problems and opportunities for improvement. Finally, they had to produce a collective synthesis of their findings, providing an overall evaluation of the spaces assessed, with suggestions for changes to enhance the user experience, which could include general and site-specific recommendations, based on good practices found in the field and/or their reading. The students had approximately one calendar month to complete the three stages of the assignment and submit their final reports.

RESULTS

While not formally part of the space assignment, the preparatory video evaluation activity provided an early indication of student interests, concerns and values. The three library spaces that attracted the most positive comment in discussion posts were quite different, but all had distinctive features that appealed to several students:

- Portland State University Library was praised for its well-equipped Family Study Room for PSU students with kids
- North Carolina State University's Hunt Library was liked for its hi tech facilities, especially the bookbot delivery system
- Santa Clara University Learning Commons was admired for its green features and three open-air terraces.

For their space assessment projects, the students used a range of approaches, which all showed clear evidence of independent thought and/or creativity in the perspective offered (as specified in the assignment grading rubric), though the extent and nature of creativity varied. Two groups created their own evaluation criteria, informed by their reading and personal experiences; and one group developed their own assessment categories, supplemented by questions taken from an existing library space evaluation tool. Four groups chose existing library/learning space assessment tools, but with some interesting and original modifications. The two groups enrolled in the online section of the course both chose a tool that had not been covered in the lecture presentation or module reading list, providing substantial evidence of independent information-seeking; they also both selected a tool developed in Australia, thus demonstrating a global perspective, and meeting institutional expectations of global competence. Our sample is too small to judge whether the demographic background and online mode of study were relevant factors here, but this was one striking difference in the approach taken.

Table 1 provides a high-level summary of the evaluation criteria used by the three groups who developed their own tools, showing the categories they defined to frame their assessments.

Campus Group 1 (6 categories)	Campus Group 2 (10 categories)	Campus Group 3 (3 guiding points)
Services (4 questions) Materials (3 questions) Amenities (6 questions) Technology (2 questions) Location (2 questions) Security (3 questions)	Location Architecture "Wow" factor Lighting Work/study space Technology Collection Signage/navigation Access to circulation, reference & library personnel Overall usefulness	Navigation/functionality • Navigating the library • Finding items Environment • Air quality • Temperature • Lighting Equity • Accessibility for disabled • Accessibility for all

Table 1. Evaluation criteria developed by students.

Group 1 from the on-campus section of the class chose six general categories as a framework and then selected 20 questions (out of 230) from the IFLA post-occupancy evaluation (POE) questionnaire (Romero *et al.,* 2013) to focus their assessments. (The term Amenities here was defined as "basic environment and structure".) Campus Group 2 specified 10 categories (reduced to a more manageable number than their original list of 12). They also listed one or two prompts about what to look for under four headings (e.g., artificial vs. natural lighting, physical technology and wireless capabilities, and "Inside and outside appearances and features" under Architecture). Group 3 opted for a broader categorization, defining three "guiding points" for evaluation, which they elaborated in more specific terms as shown in Table 1. Their first category was broader than might be assumed, as their submission explained it also included furniture and its location, "the comfort factor", proximity of electrical outlets and lighting, availability of restrooms and study space, and access to technology.

Table 2 identifies the assessment tools (and sources) selected by the four groups who chose to adopt existing evaluation criteria, and shows how they adapted the tools for their projects.

Campus Group 4 (Composite framework)	Campus Group 5 (Overarching framework)	Online Group 1 (Modified implementation)	Online Group 2 (Modified implementation)
Standards for libraries (ACRL, 2011) Hierarchy of attributes (Cunningham & Tabur, 2012) • Mapped standards to the hierarchy • Modified descriptors for the attributes	Hierarchy of attributes (Cunningham & Tabur, 2012) • Used hierarchy as basic categories • Developed their own specific criteria	TEALS (Abbasi *et al.,* 2012; Elkadi & Abbasi, 2011; Horn *et al.,* 2014) • Collapsed 10 quality criteria into 7 criteria • Assessed space qualitatively instead of quantitatively	TEALS (Abbasi *et al.,* 2012) • Reduced 10-point numerical scale to 4-point verbal scale

Table 2. Assessment tools adapted by students

Campus Groups 4 and 5 both used Cunningham and Tabur's (2012) Hierarchy of Learning Space Attributes, a multi-level schema developed by two reference and liaison librarians at the University of Toronto, who superimposed architect Fred Kent's four characteristics of desirable public spaces (Kent and Myrick, 2003) on Abraham Maslow's (1943) hierarchy of human needs, which is generally conceptualized as a pyramid. Figure 1 shows how Cunningham and Tabur (2012) present their schema.

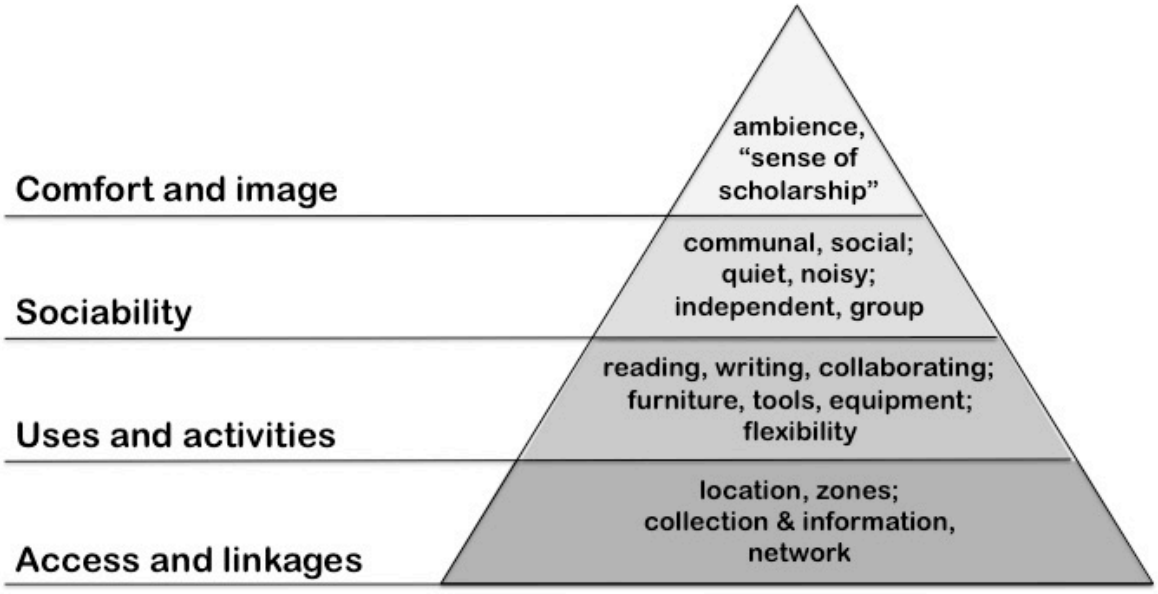

Figure 1. Hierarchy of learning space attributes (Cunningham and Tabur, 2012)

It is debatable whether Group 5 should be classed among students who used an existing tool, as although they stated that their criteria were "based on the basic categories from the 'hierarchy of learning space attributes'", in practice they developed their own nine categories using different terminology that did not explicitly reflect the hierarchical model – Exterior design and location; Basic interior environment; Usage of facilities (excluding IT facilities) and space; General IT infrastructure; Printing; Sociability and research; Navigation and service; Other services; Overall impression – although there was some direct adoption of Cunningham and Tabur's (2012) terminology among the 49 specific criteria grouped under their nine headings (e.g., "ambience" and "sense of scholarship" were included under Overall impression). In other respects their approach was closer to Campus Group 1, but using more categories and criteria.

Campus Group 4 displayed the most creativity in their adaptation of the Hierarchy of Learning Space Attributes, choosing to map key concepts from the eight performance indicators for space in the ACRL (2011) *Standards for Libraries in Higher Education* against the four categories shown in Figure 1. They combined the two frameworks visually in a modified composite version of the Hierarchy, arguing this would enable "a more comprehensive analysis of library space than a simple list of criteria… we will use the ACRL standards in order to structure our observations, and Cunningham and Tabur's pyramid structure to contextualize our observations". This combination thus provided a conceptual framework for thinking about library space and evaluating its functionality, as well as a practical set of operationalizable elements as things to focus on in their observations. Figure 2 shows how Group 4 represented their evaluation criteria.

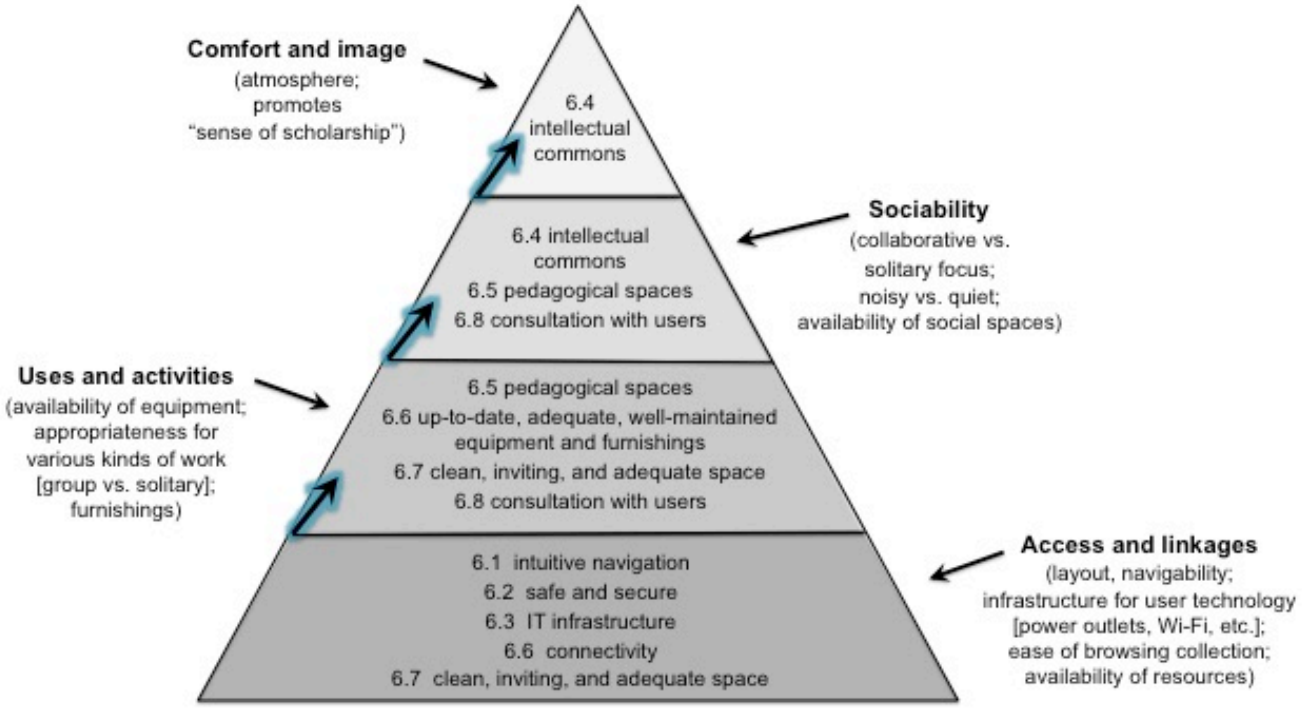

Figure 2. Composite hierarchy of space assessment criteria

Online Groups 1 and 2 both independently identified and selected the Tool for Evaluation of Academic Library Space (TEALS) developed at Deakin University, Australia (Abassi *et al.,* 2012; 2013). Commissioned by the Library from the School of Architecture and Building, TEALS goes beyond existing POE tools, serving not only as a diagnostic, but also as a prescriptive tool, identifying potential intervention and improvement strategies. In addition, it is characterized as a "reflective" and "empowering" tool that is "user-friendly, quick and easy to use" (Elkadi and Albassi, 2011), all suggesting it would be a good fit for the student project. TEALS also evaluates both functional (design) issues and social and emotional (experiential) issues, indicating synergies with Cunningham and Tabur's (2012) framework, which was also cited by Online Group 2. The TEALS framework is based on 10 Criteria of Quality (CoQ) derived from literature and library site visits:

1. Positive image and identity
2. Welcoming and inviting entry
3. Functionality and efficiency
4. Flexibility and adaptability
5. Variety of spaces to cater for different users and uses
6. Being social and people-centred
7. A sense of place and inspiration
8. Environmental comfort and sustainability
9. Access, safety and security
10. Integration of technologies

The student groups adapted the tool to fit their circumstances. Online Group 1 combined some criteria (1 and 7; 4, 5 and 10) and concentrated on qualitative data (written observations, floor plans, and photographs) to simplify and shorten their task. Online Group 2 used the full CoQ, but substituted a four-point verbal scale (Very Satisfactory [3], Satisfactory [2], Needs Improvement [1], Unsatisfactory [0]) for the standard 10-point numerical scale.

Conclusion

Library space assessment has evolved from basic quantitative measurement of usage to more holistic qualitative evaluation of the user experience. Another notable feature of current practice is the emergence of toolkits and evaluation frameworks as community resources with the potential to support comparative studies and benchmarking. Other space studies have collected data from undergraduate and graduate students via questionnaires, interviews, observations, and photographs to identify needs and preferences. The present study offers a different perspective on the desirable qualities of spaces by exploring how graduate librarianship students as both student library users and next generation professionals specify evaluation criteria and conduct space assessments.

The student-librarians in the study generally chose evaluation criteria drawn from or similar to criteria found in professional literature and they all used observation as their primary method of data collection. Although they used different frameworks, their approaches revealed many common interests and concerns, evidenced in both the general categories and specific elements they chose to frame their assessment, where access, functionality, navigation, security and technology emerged as recurring themes. There were variations in the points selected for comment in their reports that were beyond the scope of the present study, but suggest possible differences (or different priorities) in professional and/or personal values that would be interesting to explore in future research.

References

Abbasi, N., Elkadi, H., Horn, A. and Owen, S. (2012), "Transforming academic library spaces: an evaluation study of Deakin University Library at the Melbourne Burwood campus using TEALS", in *ALIA 2012: Discovery: Proceedings of the 2012 Australian Library and Information Association Biennial Conference, July 10-13, 2012, Sydney, Australia,* pp. 1-13.

Abbasi, N., Elkadi, H., Horn, A. and Owen, S. (2013), "TEALS project: evaluating physical library spaces, in Hiller, S., Kyrillidou, M., Pappalardo, A. and Self, J. (Eds.), *Building Effective, Sustainable, Practical Assessment: Proceedings of the 2012 Library Assessment Conference, October 29-31, 2012, Charlottesville, VA,* Association of Research Libraries, Washington, DC, pp. 229-237, available at http://libraryassessment.org/bm~doc/proceedings-lac-2012.pdf (accessed 14 May 2017).

ACRL (2011), *Standards for Libraries in Higher Education* (rev. ed.), Association of College & Research Libraries, Chicago, IL, available at http://www.ala.org/acrl/sites/ala.org.acrl/files/content/standards/slhe.pdf (accessed 14 May 2017).

ACRL Research Planning and Review Committee (2012), "2012 top ten trends in academic libraries: a review of the trends and issues affecting academic libraries in higher education", *College & Research Libraries News* Vol. 73 No. 6, pp. 311-320, available at http://crln.acrl.org/index.php/crlnews/article/view/8773/9333 (accessed 14 May 2017).

ALA (2009), *ALA's Core Competences of Librarianship,* American Library Association, Chicago, IL, available at http://www.ala.org/educationcareers/careers/corecomp/corecompetences (accessed 14 May 2017).

Bedwell, L. and Banks, C.S. (2013), "Seeing through the eyes of students: participant observation in an academic library", *Partnership: The Canadian Journal of Library and Information Practice and Research* Vol. 8 No. 1, available at https://journal.lib.uoguelph.ca/index.php/perj/issue/view/155#.VIOPkIeRp2c (accessed 14 May 2017).

CARL (2010), *Core Competencies for 21st Century CARL Librarians,* Canadian Association of Research Libraries/L'Association des bibliothèques de recherche du Canada, Ottawa, ON, available at http://www.carl-abrc.ca/doc/core_comp_profile-e.pdf (accessed 14 May 2017).

Cowan, S.M. (2012). *Assessment 360: mapping undergraduates and the library at the University of Connecticut,* Council on Library and Information Resources, Washington, DC, available at http://www.clir.org/pubs/resources/Assessment360.pdf (accessed 14 May 2017).

Crumpton, M.A. and Bird, N.J. (2013), "Assessment", in Crumpton, M.A. and Bird, N.J., *Handbook for community college librarians,* Libraries Unlimited, Santa Barbara, CA, pp. 125-131.

Cunningham, H.V. and Tabur, S. (2012), "Learning space attributes: reflections on academic library design and its use", *Journal of Learning Spaces* Vol. 1 No. 2*,* available at http://www.partnershipsjournal.org/index.php/jls/article/view/392/287 (accessed 14 May 2017.

Daniels, W., Darch, C. and de Jager, K. (2010), "The Research Commons: a new creature in the library", *Performance Measurement and Metrics* Vol. 11 No. 2*,* pp. 116-130. DOI: 10.1108/14678041011064043.

Designing Libraries (2004-). *A Database and Image Gallery of Library Buildings,* available at http://www.designinglibraries.org.uk (accessed 15 September 2015).

Deusto University (2009, February 2), *University Library – LRC* [Video, 6:25 min.], available at http://youtu.be/IzUYGnEm9oI (accessed 14 May 2017).

Elkadi, H. and Abbasi, N. (2011), "Development of a tool for evaluation of academic library spaces (TEALS)", in *Positive Futures for Higher Education: Connections, Communities and Criticality: 2011 Society for Research into Higher Education Annual Research Conference, December 7-9, 2011, Newport, Wales*, available at http://www.srhe.ac.uk/conference2011/abstracts/0242.pdf (accessed 14 May 2017).

Fox, R. and Doshi, A. (2011), "Longitudinal assessment of "user-driven" library commons spaces", in Hiller, S., Justh, K., Kyrillidou, M. and Self, J. (Eds.), *Building Effective, Sustainable, Practical Assessment: Proceedings of the 2010 Library Assessment Conference, October 24-27, 2010, Baltimore, MD,* Association of Research Libraries, Washington, DC, pp. 63-72, available at http://libraryassessment.org/bm~doc/proceedings-lac-2010.pdf (accessed 14 May 2017).

Garritano, J.R. and Yatcilla, J. (2014), "Participatory design of the Active Learning Center: a combined classroom and library building", in Foster, N.F. (Ed.), *Participatory Design in Academic Libraries: New Reports and Findings,* Council on Library and Information Resources, Washington, DC, pp. 88-99, available at http://www.clir.org/pubs/reports/pub161 (accessed 14 May 2017).

Germany, L. (2014), "Learning space evaluations – timing, team, techniques", in Fraser, K. (Ed.), *The Future of Learning and Teaching in Next Generation Learning Spaces,* Emerald, Bingley, UK, pp. 267-288.

Grand Valley State University (2013, September 30), *The Mary Idema Pew Library* [Video, 4:35 min.], available at http://youtu.be/AIYHU68VZqQ (accessed 14 May 2017).

Horn, A., Lingham, B. and Owen, S. (2014), "Library learning spaces in the digital age", in *Measures for Success: Library Resources and Effectiveness under Scrutiny: Proceedings of the 35th Annual IATUL Conference, June 2-5, 2014, Espoo, Finland,* available at http://docs.lib.purdue.edu/iatul/2014/libraryspace/2/ (accessed 14 May 2017).

Johns Hopkins University (May 20, 2013), The Brody Learning Commons: A Second Home [Video, 4:19 min.], available at https://youtu.be/dNUxzJwDw_o (accessed 14 May 2017).

Kent, F. and Myrick, P. (2003), "How to become a great public space", *American Libraries* Vol. 34 No. 4, pp. 72-74, 76, available at http://engl-boston-culture-course.wikispaces.umb.edu/file/view/article-How+to+Become+a+Great+Public+Space.pdf (accessed 14 May 2017).

Line, M.B. (2002), "Library buildings: a user's viewpoint", *LIBER Quarterly* Vol. 12 No. 1, pp. 73-87, available at http://doi.org/10.18352/lq.7669 (accessed 14 May 2017).

Lippincott, J.K. and Duckett, K. (2013), "Library space assessment: focusing on learning", *Research Library Issues,* No. 284, pp. 12-21, available at http://publications.arl.org/rli284/12 (accessed 14 May 2017).

Maslow, A.H. (1943), "A theory of human motivation", *Psychological Review* Vol. 50 No. 4, pp. 370-396. DOI: 10.1037/h0054346.

McDonald, A. (2006), "The ten commandments revisited: the qualities of good library space", *LIBER Quarterly* Vol. 16 No. 2, available at http://doi.org/10.18352/lq.7840 (accessed 14 May 2017).

Moniz, R., Henry, J. and Eshleman, J. (2014), "Evaluation", in Moniz, R., Henry, J. and Eshleman, J., *Fundamentals for the Academic Liaison,* Neal-Schuman, Chicago, IL, pp. 167-182.

Nitecki, D.A. (2011), "Space assessment as a venue for defining the academic library", *Library Quarterly* Vol. 81 No. 1, pp. 27-59. DOI: 10.1086.657446.

North Carolina State University (2013, July 30), *The Hunt Library Story* (updated) [Video, 8:12 min.], available at http://youtu.be/Okr78MUrlmI (accessed 14 May 2017).

Oakleaf, M. (2013), "Building the assessment librarian guildhall: criteria and skills for quality assessment", *Journal of Academic Librarianship,* Vol. 39 No. 2, pp. 126-128. DOI: 10.1016/j.acalib.2013.02.004.

Ohio State University (2009, August 27), Ohio State's New Library [Video, 5:16 min.], available at http://youtu.be/ak7FEQjxqBY (accessed 14 May 2017).

Passonneau, S. and Erickson, S. (2014), "Core competencies for assessment in libraries: a review and analysis of job postings", *Library Leadership & Management* Vol. 28 No. 4, available at: https://journals.tdl.org/llm/index.php/llm/article/view/7080/6308 (accessed 14 May 2017).

Portland State University (2013, May 17), Beyond the Books: What's New at the Portland State Library [Video, 3:13 min.], available at http://youtu.be/2x9M97L5Sr4 (accessed 14 May 2017).

Romero, S., Latimer, K., Sommer, D., Scherer, J., Clevström, S., Edebro-Sikström, I., Eigenbrodt, O. and Bostick, S. (2013), *Questionnaire on Post-Occupancy Evaluation of Library Buildings,* IFLA Library Buildings and Equipment Section, The Hague, Netherlands, available at http://www.ifla.org/publications/questionnaire-on-post-occupancy-evaluation-of-library-buildings (accessed 14 May 2017).

Santa Clara University (2009, November 30), *A New Learning Commons and Library: The Heart of Academics* [Video, 3:18 min.], available at http://youtu.be/qiFZd2--tf8 (accessed 14 May 2017).

Saunders, L. (2015), Academic libraries' strategic plans: top trends and under-recognized areas. *Journal of Academic Librarianship* Vol. 41 No. 3, pp. 285-291. DOI: /10.1016/j.acalib.2015.03.011.

Schlipf, F. (2011), "The dark side of library architecture: the persistence of dysfunctional designs", *Library Trends* Vol. 60 No. 1, pp. 227-255. DOI: 10.1353/lib.2011.0034, available at https://www.ideals.illinois.edu/handle/2142/31870 (accessed 14 May 2017).

Stewart, C. (2011), "Building measurements: assessing success of the library's changing physical space", *Journal of Academic Librarianship* Vol. 37 No. 6, pp. 539-541. DOI: 10.1016/j.acalib.2011.09.002.

Stewart, C. (2015), *Building with Purpose: A Quantitative Overview and Analysis of New U.S. Academic Library Construction, 2000–2014,* Association of College and Research Libraries, Washington, DC, available at www.ala.org/acrl/sites/ala.org.acrl/files/content/publications/whitepapers/stewart_building.pdf (accessed 14 May 2017).

Town, J.S. (2011), "Value, impact, and the transcendent library: progress and pressures in performance measurement and evaluation", *Library Quarterly* Vol. 81 No. 1, pp. 111-125. DOI: 10.1086/657445, available at http://www.jstor.org/stable/10.1086/657445 (accessed 15 September 2015).

Treadwell, J., Binder, A. and Tagge, N. (2012), "Seeing ourselves as others see us: library spaces through student eyes", in Duke, L.M. and Asher, A.D. (Eds.), *College Libraries and Student Culture: What We Now Know,* ALA Publishing, Chicago, IL, pp. 127-142.

University of Edinburgh (2010, March 9), *£60m University Library Upgrade* [Video, 6:01 min.], available at http://youtu.be/c5dHUVQ2T6Q (accessed 14 May 2017).

Watson, L., and Howden, J. (2013), "UK projects and trends", in Watson, L. (Ed.), *Better Library and Learning Space: Projects, Trends, Ideas,* Facet, London, pp. 5-19.

Wong, G. K. W. (2014, "Using strategic assessment to demonstrate impact: a case study at the HKUST learning commons", *Library Management* Vol. 35 No. 6/7, pp. 433-443. DOI: 10.1108/LM-10-2013-0100.

Wright, S., & White, L.S. (2007), *Library Assessment,* SPEC Kit 303, Association of Research Libraries, Washington, DC, available at http://publications.arl.org/Library-Assessment-SPEC-Kit-303 (accessed 14 May 2017).