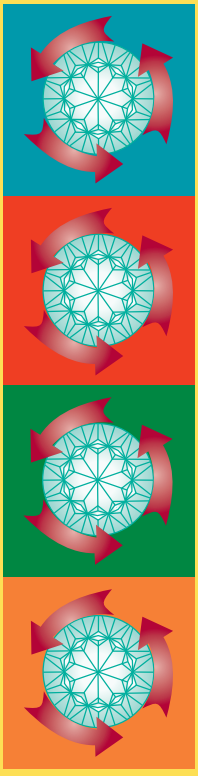
A Guide
Planning for Assessing 21st Century Spaces for 21st Century Learners

Learning Spaces Collaboratory



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Jeanne L. Narum
Learning Spaces Collaboratory (LSC)
http://pkallsc.org/

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Fall 2013

> To be able to ask a question clearly is two-thirds of the way to getting it answered.
> — John Ruskin (1819 – 1900)

This is a guide for planning for assessing spaces for learning, developed under the auspices of the Learning Spaces Collaboratory with support from the National Science Foundation (NSF). It is designed to spark broader and more informed dialogue—on individual campuses and within national communities of stakeholders—about the relationship between the quality of learning and the quality of spaces for learning in the undergraduate setting. It is designed to encourage deeper attention to questions planners should ask in developing new and reshaped spaces that better inform the process of assessing how such spaces impact learning.

In these pages we capture the growing national awareness that space matters to learning and that institutional initiatives to transform the undergraduate learning environment require attention to *where* students learn as well as to *what* and *how* they learn. The stories illustrate how physical spaces embody a community's mental image of how and where learning happens, whether such spaces be single classrooms or major facilities, new or repurposed, or used by a single department or a broader community of learners.

Our commitment to NSF was to develop a template for "planning for assessing" as a guide for those responsible for the quality and character of the undergraduate learning environment—at a single college or university and/or within larger communities of stakeholders. From an understanding of the power of learner-centered planning, the working group of academics and architects began by asking questions about how learning happens, bringing their diverse experiences and expertise in shaping and reshaping learning environments to the table.

Distilling our discussion, it became clear that the foundational question was about becoming: about what our students were to become, and what they would be recognized for becoming and accomplishing. This focus on "becoming" emerged as we realized the biggest planning for assessing questions were about how investments in physical spaces made a difference in how students experienced learning. These experiences enabled learners to become resilient, entrepreneurial problem-solvers well prepared for citizenship and leadership in today's dynamic world.

As this guide evolved, it became clear that return on investment of time, energy, and funds could be measured also in how a campus community speaks about and shares a vision about how learning happens and about why space matters.

Jeanne L. Narum

Jeanne L. Narum, Principal—Learning Spaces Collaboratory
For the LSC NSF Working Group

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What do we want our learners to become?

Agents of their own learning

Transdisciplinarians: Renaissance people for the digital age

Code writers, code readers, code breakers

Entrepreneurs. Analysts and creators of digital technologies

Reflective practitioners of well-researched pedagogies in their use of space to support learning

Creative thinkers, who recognize there may be a new solution

Tolerant participants, who appreciate diversity of multiple cultures

Effective communicators, with skills for multiple media and venues

Enthusiastic and passionate about interdisciplinary science

Aware that boundaries in science are artificial

Well-trained experimentalists who think critically

Aware of the powerful role they play in their own learning

Connected with faculty, support providers, and peers during the learning process

Digitally literate citizens who communicate about and use technology effectively

---

What experiences make that becoming happen?

Exchanging learning, mentorship, and discovery between teachers and students

Fusing the liberal arts context and a research-based science curriculum

Immersing students in a world of group learning and cutting-edge instrumentation

Open-door policies regarding student access to faculty offices to promote informal interaction

Becoming exposed to diverse disciplines, ways of learning, pedagogical approaches

Having opportunities to study the effects of a teaching innovation in a pilot setting

Having access to a "laboratory" space to experiment with innovative pedagogies

Learning from the space, not just in the space

Constructing and applying knowledge to relevant problems

Having easy access to cutting-edge visual technologies and staff with relevant technical expertise

Experiencing learning in an environment in which interdisciplinary boundaries are dissolved

Classroom activities that require and reward critical discussion

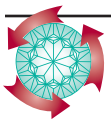
Having students take ownership of the space— feeling comfortable and in control

— Excerpted from the Profiles

Part I
Introduction

For much of the 20th century, learning had focused on the acquisition of skills or transmission of information or what we define as “learning about.” Then, near the end of the 20th century learning theorists started to recognize the value of “learning to be,” of putting learning into a situated context that deals with systems and identity as well as the transmission of knowledge. We want to suggest that now even that is not enough. Although learning about and learning to be worked well in a relatively stable world, in a world of constant flux, we need to embrace a theory of learning to become. Where most theories of learning see becoming as a transitional state toward becoming something, we want to suggest that the 21st century requires us to think of learning as a practice of becoming over and over again. … to embrace change and focus on becoming as central and persistent elements of learning.

— Douglas Thomas & John Seely Brown. “Learning for a World of Constant Change: Homo Sapiens, Home Faber & Homo Ludens revisited.”



Introduction

About the Learning Spaces Collaboratory (LSC)

Research on how people learn offers design professionals and academic leaders intriguing opportunities for shaping and reshaping undergraduate learning environments for 21st century learners. Within and beyond STEM fields, faculty and their administrative colleagues on campuses across the country are making research-based decisions about what their students should learn and about how that learning is to happen.

From the work of these pioneering agents of programmatic and pedagogical change, there is a substantial body of evidence validating that learning is most robust as students begin to realize the powerful role they play in their own learning and become responsible for constructing their learning. This evidence validates findings that deep learning happens as learners become socialized into a community of learners on-campus and develop a sense of identity with a community of practice beyond campus.

The Learning Spaces Collaboratory (LSC) is based on the premise that robust learning happens as students are:

- Actively engaged in evaluating, constructing, and reevaluating their own knowledge
- Actively engaged in a social and supportive community
- Encouraged to assess, reflect, and build on prior knowledge
- Empowered to address problems that are meaningful personally and of import to the world beyond the campus.

We recognize that as robust learning empowers learners, students are becoming agents of their own learning. They are becoming adventurous, tolerant of ambiguity, eager to ask new questions; they are testing the boundaries and limits of what is known, not known. Thus, robust learning happens when it is:

- Iterative and non-linear
- Provisional, always in a state of flux of becoming
- Scaffolded and transferable
- In turn, social and solitary
- Understood by all—student and teacher—as preparation for what comes next.

~~~~~

We recognize that robust learning happens when those responsible for the physical environment for learning ask questions such as:

- Is what is known about how learning happens from research, and from findings from the work of change agents in other settings, influencing how learning happens on our campus? If so, how and where?
- How might such research and findings about how learning happens, within and beyond our campus, help us fulfill our responsibilities as planners more creatively, efficiently, and cost-effectively?
- How do 21st century mental images of how learning happens differ from those held by previous generations of planners? How do mental images about learning influence our planning?
- Beyond these findings on how learning happens, what other contextual issues must be identified and addressed in giving attention to spaces for learning on our campus, now and into the future?[1]
~~~~~

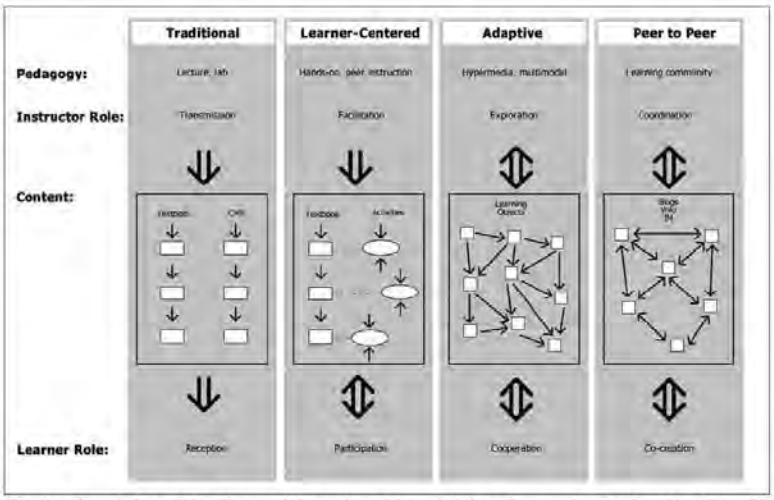
The challenge of how to capitalize on the power of emerging technologies for teaching and learning drove colleagues in art history and archeology at the University of Maryland College Park to imagine how to reconfigure existing spaces. Beginning with exploratory conversations in the existing workroom, faculty developed an intellectual and social collaboratory from which a vision of a physical collaboratory emerged.

A static depiction of video of maps of China and of the Silk Road, Michelle Smith Collaboratory for Visual Culture, University of Maryland College Park

Translating that vision into reality began with a prototype for the cluster of spaces that became the Michelle Smith Collaboratory for Visual Culture. The experience of the collaborators, comprising in-house teams of faculty and staff, provides evidence that modest renovations can have major impact, transforming the learning experience of faculty and students within particular fields; such experiences can also become prototypes for further space renewal at the institutional level.

Weigle Commons, a repurposed space in the library at the University of Pennsylvania, also capitalized on the potential of technologies for deepening learning, but here more quietly pervasive than within the Digitorium or Collaboratory. Responding to the question, "How do the students come to feel a space as their own?" The Commons reflects a mental image of learning as inherently social, an awareness that students learn best with and from each other, and when learning is fun. Perhaps, as suggested by Scott Bennett, the Commons illustrates how libraries are being transformed into "liboratories."[14]

Student-owned spaces, Weigle Commons, University of Pennsylvania



Moving from left to right, the models go from hierarchical to democratic. In the "Traditional" model, CMS is a course management system. The nature and organization of course content mirrors the philosophy of the instruction. Effective teaching avoids pure transmission but can draw judiciously from all the silos. Peer-to-peer models do not remove the authority of the instructor but adapt the progress of the course according to student performance and feedback.

—Four Schema for Pedagogy with Different Roles for Student and Instructor. Chris Impey. "Chapter 5: Science Education in the Age of Science." American Academy of Arts & Sciences. *Science and the Educated American: A Core Component of Liberal Education*. Cambridge, MA. 2010.

Methods of Teaching and Learning

If what is taught has become a matter of concern, the question of how learning takes place has become an even more widespread and urgent concern. Though more is known about effective pedagogy than about the results of curriculum choice, numbers of writers conclude that the existing faculty emphasis on undergraduate teaching, such as it is, is misplaced and that more attention should be devoted to student learning rather than teaching. The goal and outcome of a successful undergraduate experience, the critics argue, should be learning, to which teaching makes a major contribution. But teaching is the means, not the end, of education. Learning is the product of education and teaching is but one means—though a significant one. To devote faculty time to tinkering with course requirements, to the neglect, some argue, of the learning outcomes associated with them, may be as inappropriate as the preoccupation and reimbursement of hospitals for length of patient stay rather than the beneficial results of patient care. The emphasis on teaching as an end in itself, rather than a means of learning, reflects a wider neglect of interest in pedagogy. The heavy reliance on the conventional lecture format—representing, some critics argue, almost everything that is the antithesis of what we know about the best methods of effective learning—is an unhappy example.

— Frank H.T. Rhodes. “Chapter 2: Science as a Liberal Art.” American Academy of Arts & Sciences. S*cience and the Educated American: A Core Component of Liberal Education*. Cambridge, MA. 2010.

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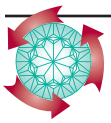


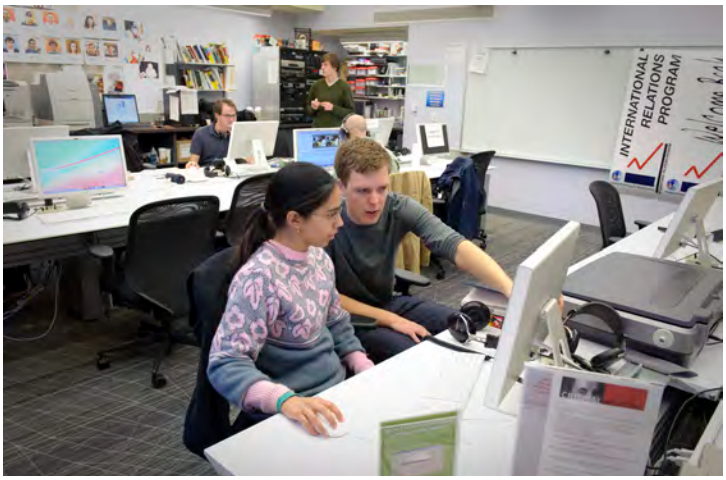
Weigle Information Commons & Education Commons
University of Pennsylvania Libraries

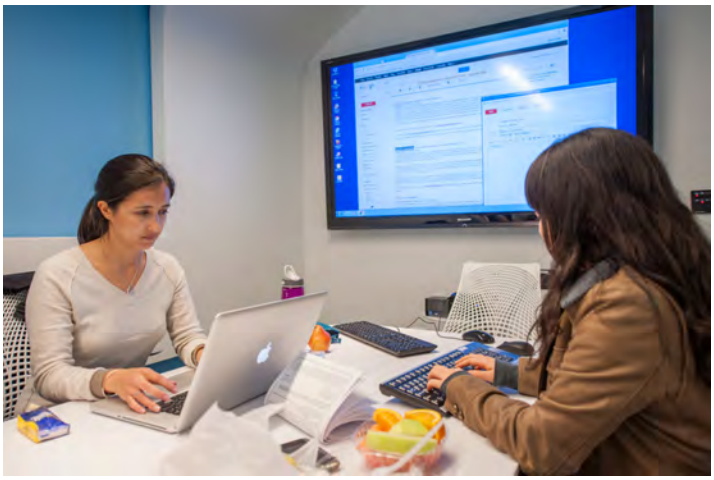
WHAT DO WE WANT OUR LEARNERS TO *BECOME*?

- Aware of the powerful role they play in their own learning.
- Effective collaborators and participants in team activities.
- Comfortable asking for assistance and accessing expert advice in a timely manner.
- Connected with faculty, support providers, and peers during the learning process.
- Digitally literate citizens who communicate about and use technology effectively.

WHAT EXPERIENCES MAKE THAT *BECOMING* HAPPEN?

- Collaborating in a flexible, technology-rich space.
- Interacting with tutors, peer advisors, faculty, teaching assistants, librarians.
- Preparing, practicing, recording, and receiving feedback on presentations.
- Connecting virtually via video and web conferencing.
- Having students take ownership of the space— feeling comfortable and in control.





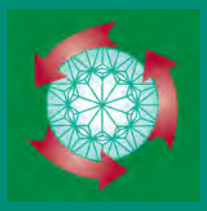
WHAT SPACES ENABLE THOSE EXPERIENCES?

- Bright, cheerful, inviting spaces that provide a relaxed yet study-focused ambience.
- A variety of spaces close together so groups can reconfigure on the fly.
- Space with well-integrated, reliable, and robust technology.
- Clean design with transparent and semi-transparent boundaries between spaces.
- Self-service use models with clearly marked assistance available nearby.

HOW DO WE KNOW?

- Visual confirmation: the spaces are full and vibrant, with a variety of learning related activities.
- Engagement: students interact with staff and peers in-person, virtually and through social media.
- Inspiration: faculty inspired to explore multimedia use in pedagogy, new types of assignments and course materials.
- Behavior: students ask questions, make suggestions, help each other, present workshops.

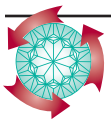
Part II-B
Institutional Essays



There is one timeless way of building. It is thousands of years old, and the same today as it has always been. The great traditional buildings of the past, the villages and tents and temples in which man feels at home, have always been made by people who were very close to the center of this way. It is not possible to make great buildings, or great towns, beautiful places, places where you feel yourself, places where you feel alive, except by following this way.

There is a definable sequence of activities which are at the heart of all acts of building, and it is possible to specify, precisely, under what conditions these activities will generate a building which is alive. All this can be made so explicit that anyone can do it.

— Christopher Alexander. *The Timeless Way of Building*. Oxford University Press, 1979.



Research from the field of cognitive science provides one answer to two fundamental questions facing today's leaders intent on creating a learner-centered environment:

- why is such an environment needed?
- how can such an environment be realized?

Insights from this research have been a catalyst on many campuses for taking a new look at how students learn. It validates what heretofore had been mostly intuitive: that people learn best by working in teams, when they have personal engagement with what is being learned, and when what they are learning becomes relevant to the intellectual and physical worlds they experience beyond the classroom and lab. Most important, that learning is most effective when there is a visible and supporting community.

A learning environment developed from such insights is distinctly different from one that sees the student as a passive recipient of information transmitted from a teacher.

— From the LSC Archives

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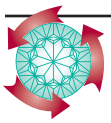


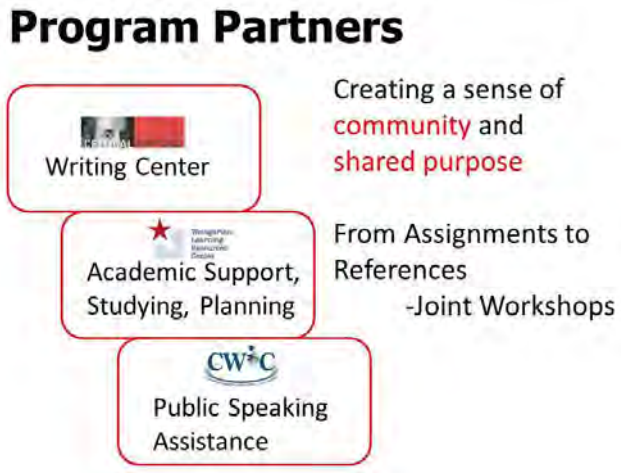
Weigle Information Commons and Education Commons
University of Pennsylvania Libraries

Background

Noticing a growing emphasis on teamwork and collaborative problem-solving in academic curricula, administrators from the School of Arts and Sciences, the Office of the Provost and Penn Libraries began in 2001 to discuss the potential for a “collaboratory” where students would work in groups and access academic support services. Planning included regular meetings of groups of faculty and staff and continued for several years. Planners identified for renovation a large space on the first floor of the main library building, already a popular hub for undergraduate study.

Planning Goals

- Embrace guidance from the university president to focus attention on the needs of undergraduate students.
- Create a technology-rich crossroads on campus to build connections across organizations and schools.
- Create a sense of community and shared purpose among staff across campus who support student services, in order to give students easy access to assistance.



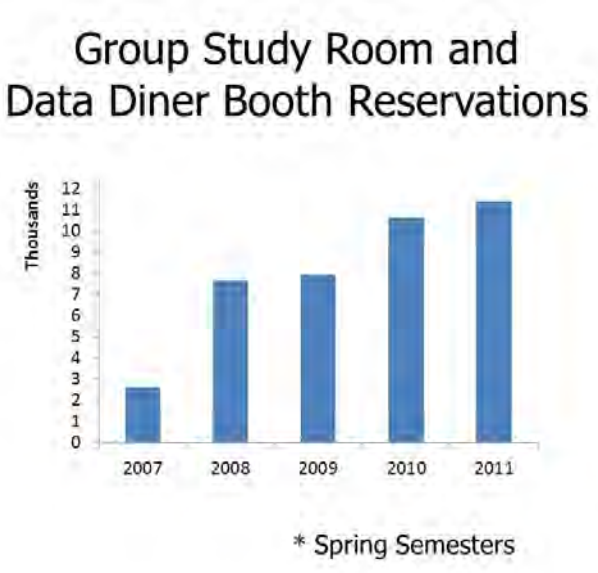
Planning Process

The planners began with an overall image of a self-service space with a variety of sub-spaces and robust technology infrastructure. The planning process, which included visits to campuses with similar facilities, nurtured new partnerships with academic centers around the campus. These partnerships, which have continued, are a critical factor in the ongoing success of the space. Supported by fundraising and a naming gift, the David B. Weigle Information Commons opened in 2006.

> The Information Commons is a superb space for collaborative learning. The resources are phenomenal, and the staff is friendly, helpful, knowledgeable. [My students] found the booths ideal for hammering out script and casting differences.
> — Writing Center Director

Key Features

The twelve “data diner” booths are a key feature of the Weigle Information Commons (WIC), filled with student groups from early morning until the space closes at 2 a.m. They are popular with undergraduates who can reserve a booth and “make it their own”. Each booth has a monitor on an articulated arm, a PC laptop with webcam, and connections for personal use.



Weigle Information Commons and Education Commons
University of Pennsylvania Libraries

WIC has ten group study rooms with installed screens, adjustable monitors, PC and Mac computers, video-recording and video-conferencing. Several rooms support self-recording of presentations. A high-touch media lab supports creation of video, audio and animation content. Students borrow gadgets such as video-cameras, iPads, microphones and clickers.

For the staff, student ownership means letting go! Use of the space is dramatically high, filling to capacity on a daily basis. Students move furniture around the space, reconfiguring group spaces as they need. The space is noisy and bustling. Over 27,400 groups reserved the group study spaces during the 2011-12 fiscal year.

The WIC has established a strong brand on campus for providing direct assistance to undergraduates and supporting faculty exploration of new media technologies. Over 325 workshops attracted over 2,700 participants during the 2011-12 fiscal year. In the hands-on training sessions, freshmen, graduate students, faculty and staff share the common, often intimidating, journey of learning new software skills.

Plan of the Weigle Information Commons

Impact Across Campus

Awareness of the popularity and effectiveness of the Weigle Information Commons led to a decision in 2010 by the university president to designate a second space for Penn Libraries to manage at the other end of campus.

The new space, the Education Commons, opened in March 2012. It has the unusual location of being situated in the arcade of Franklin Field, the University's stadium. Attractive to student athletes, its proximity to the campus science quad has helped to inform programming.

Technology is well integrated in both spaces. All computers include an extensive array of educational, media creation and productivity software. Both spaces support video-recording and video-conferencing. Both include self-service scanning, wireless printing, and moving whiteboards. Both include a variety of spaces in close proximity so a large class in a seminar room can break up into small group discussions in informal spaces without advance planning. Services are designed so that it is intuitive and inviting for students to ask for help.

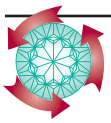
Students comment that the Weigle Information Commons has a "daytime" feel with bright orange hues and sharp-edged booths and that the Education Commons has a "nighttime" feel with its blue décor and undulating banquettes. Both are clearly marked as spaces where students can be casual, relaxed with conversations and cell phone use, and generally feel in control of the space.

Architect:
Weigle Information Commons (2006): Ann Beha
Education Commons (2012): Joel Sanders
Photos courtesy of: David Toccafondi
Location: Philadelphia, PA
Net/gross square footage: 6,600 square feet
Construction period: 2005 to 2006 for Weigle Information Commons, 2011 to 2012 for Education Commons
Date completed: 2006

Part III
Endnotes and Resources

Planning is an unnatural process;
it is much more fun to do something....
The nicest thing about not planning is that failure
comes as a complete surprise, rather than being
preceded by period of worry and depression.

Sir John Harvey-Jones



Institutional Resources: Part II-A & II-B

LSC Webinar: The University of Minnesota Experience with Active Learning Classrooms
http://www.pkallsc.org/events/lsc-webinar-university-minnesota-experience-active-learning-classrooms-0

Notre Dame University—Jordan Hall:

Jordan Hall Website
http://science.nd.edu/about/facilities/jordan/

On Campus at Notre Dame - Jordan Hall of Science Video
https://www.youtube.com/watch?v=njvVBuGHoVg

An Interview with Dennis C. Jacobs, Former Vice President and Associate Provost, University of Notre Dame
http://www.pkallsc.org/sites/all/modules/ckeditor/ckfinder/userfiles/files/Notre%2520Dame%2520Interview.pdf

University of Pennsylvania Libraries—Weigle Information Commons (WIC) & Education Commons (EC)

WIC Website
http://wic.library.upenn.edu/

WIC Facebook
http://www.facebook.com/pages/Weigle-Information-Commons/58055473584

WIC Facilities
http://wic.library.upenn.edu/wicfacilities/

WIC Music Video
http://www.youtube.com/watch?v=4z4Z717yD08&feature=plcp

WIC Services Video
http://www.youtube.com/watch?v=muv4tOw29i0&feature=player_embedded

EC Website
http://www.library.upenn.edu/ec/

EC Facebook
http://www.facebook.com/PennEduCom

EC Gallery
http://www.library.upenn.edu/ec/gallery.html

Note: An archive of research papers and other resources relevant to planning for assessing learning spaces is on the LSC website (see Resources). Further contributions from the community are invited.

Send to: jlnarum.lsc.ico@gmail.com
Subject: Resource: Planning for Assessing Learning Spaces