

# **Collaborative and Learning Spaces**

**Submitted**

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## Introduction

### CaLS Committee Charge and Composition

This is a report of the Collaborative and Learning Spaces (CaLS) Task Force, composed of interested UB faculty, academic support staff, and librarians. Its primary purpose is to inform the campus master planning effort currently underway. The charge of the task force was twofold: explore learning outcomes which could be accomplished only through non-traditional, collaborative, perhaps experimental, learning environments; and articulate UB's teaching, learning, and research interests in a form which can be used to engage the resources of information technology corporate sponsors, such as Apple Inc., again with a focus on collaborative learning.

UB's master planning effort seeks *to advance the vision of UB as a great major public research university that sets the standard of a model 21st-century university — an open place of learning and a generator of new ideas that serves a diverse population in today's knowledge-based society.* Integral to the physical plan is transporting UB's teaching and learning space designs from traditional instructor-focused facilities toward collaborative learning environments which foster new instructional scenarios assisted by strategic support for 21<sup>st</sup> century educational technology tools. Thus, the work of this task force opens a conceptual page on designing new approaches to physical facilities focused on future learners with 21<sup>st</sup> century technological skills.

The composition of the task force is as follows:

#### Sponsors

- James A. Willis (Executive Vice President for University Services) - Executive Sponsor
- Elias G. Eldayrie (Chief Information Officer) – Sponsor

#### Membership

- Rick Lesniak (Computing and Information Technology) – Convener
- Peter Rittner (College of Arts and Sciences) – Convener
- Michael Bouquard (College of Arts and Sciences, Media Study)
- Michael Cowen (College of Arts and Sciences, Mathematics)
- Ken English (School of Engineering and Applied Sciences, Mechanical and Aerospace Engineering)
- Allen Gaeddert – (Computing and Information Technology)
- Jim Gordon (University Libraries)
- Chris Jacobs (College of Arts and Sciences, Music)

- Maureen Jameson (College of Arts and Sciences, Romance Languages and Literatures)
- Joel Kuntz (College of Arts and Sciences)
- Carl Lee (College of Arts and Sciences, Media Study)
- Kemper Lewis (School of Engineering and Applied Sciences, Mechanical and Aerospace Engineering)
- Dom Licata (College of Arts and Sciences, Visual Studies)
- Cort Lippe (College of Arts and Sciences, Music)
- Bruce Pitman (College of Arts and Sciences, Mathematics)
- Steve Roberts (University Libraries)
- Lisa Stephens (Computing and Information Technology)
- Steven Sturman (School of Social Work)
- Robin Sullivan (University Libraries)
- Don Trainor (Computing and Information Technology)
- Athena Tsembelis – (School of Dental Medicine)
- Dave Yearke (Science and Engineering Node Services)
- Randy Yerrick (Graduate School of Education)

The Task Force was joined and assisted by Rick Bettencourt, Lester Ray, and Roger Sampson of Apple Computer.

### **CaLS Task Force Process**

The Task Force met twice and drew upon extensive resources to explore emerging learning spaces in other universities – both those the University considers peers and those it aspires to equal. A wiki (software which allows users to create, edit, and link collaborative web pages and build communities) was established to share and explore information and thoughts, including the University’s institutional research report on the future of public computing, entitled “Future Learning Spaces at UB,” and focus groups as well as both internal and external surveys. The following is a brief presentation of a vision for the University at Buffalo to create collaborative and learning spaces on Founders Plaza and elsewhere on campus.

### **CaLS Vision**

Many students no longer prosper in “traditional” learning environments. They are highly visual, easily integrate content in various media, and readily work collaboratively. Many faculty members have responded to these changes by teaching in ways which incorporate multiple media and by making assignments which require collaboration. The University currently has no dedicated facility to support this form of collaboration.

Increasingly, universities are compelled to build infrastructure and resources which support new teaching and learning paradigms. The University Libraries are in the process of planning a reconfiguration of their space in Lockwood Hall. The result, if realized, would anchor that end of Founders Plaza with an active learning space. The physical location of an initial collaborative and learning space (CaLS) – in 15 and 118 Norton Hall at the other end of Founders Plaza – would constitute a high impact environment very visible to visitors and prospective students and easily accessible to faculty and enrolled students.

To address this challenge, a broadly representative group of faculty, instructional designers, professional support staff, and librarians were convened to consider and collaborate through the sharing of ideas, opinions, reports, data and multimedia materials to explore a unique intersection of opportunities:

- The formal articulation of a learning space, based on existing data and an examination of best practices from peer institutions, coupled with
- space already equipped with much of the infrastructure required to support higher level collaborative technologies.

Interest from an institutional partner (Apple Inc.) could bring considerable expertise to inform the evaluative process.

Regardless whether we agree that the way students are learning today is effective or optimal, contemporary students often operate in multimodal, multitasking ways, with tools and methods actively reinforced by their K-12 learning experiences. Students arrive at the University already recording and editing videos to illustrate examples of learning. They communicate through blogs and wikis – though they may not share a common vocabulary to describe these tools. Ask a student if s/he is using a blog and s/he may say “no,” but ask the same student if s/he’s logged on to MySpace and s/he may well say “yes.” Students’ terminology for tools which are native to their daily lives may not reveal commonalities in the terms familiar to educators and educational technology professionals.

### **Data Supporting the CaLS Vision**

Over half of our students report using *UBlearns*, the course management system employed in more than 2,500 courses; 22% report that at least one of their classes requires the use of an external wiki or blog. Not all students are technically expert, and data suggest it would be a grave error to assume that the majority of students enter the University with the knowledge to manage mobile devices and Web 2.0 applications. Nonetheless, if we downplay or ignore the rapidly emerging shift in the uses of technology for learning while other universities accommodate new learning styles, we will fail to serve our students and may well position our institution in a competitively disadvantageous posture.

The *CIT/University Libraries Future Learning Spaces at UB Study* reported outcomes from student focus groups that explored the need and configuration for collaborative learning spaces at UB. Students were overwhelmingly positive when presented with learning space images and descriptions that focused on open, comfortable, flexible and collaborative configurations. The purpose and use of particular configurations resonated immediately with the student focus groups. The study revealed a number of unexpected results as well: students desire the presence of other students to suggest appropriate uses for space and as motivation reinforcement for their own academic efforts; students want privacy *and* visibility when utilizing learning spaces; and access to collaborative learning spaces is an important theme since they believe the most desirable spaces are typically reserved for special groups or purposes.

The spring 2007 faculty survey yielded significant data supporting the need for investment in collaborative/learning spaces and Web 2.0 tools. Over half of our faculty members encourage student use of technology through presentation software and online resources. More than one-third influence technology adoption through grade weight, including use of chat forums. Nearly one-quarter of our faculty are already using digital course capture for primary instruction or tutorial review. The survey revealed that 15% of our faculty members refer students to externally supported blogs or wikis because there are currently no centrally provided resources for these collaborative tools in-house, including UBlerns. This finding raises a serious concern about privacy and academic integrity. There is little doubt that these tools are necessary; the larger question remains how best to package them and whether to present them in an integrated manner – to optimize group collaboration in person, virtually, or both.

Historically, the University at Buffalo is (at its most aggressive) an early adopter of educational/information technology. The establishment of the collaborative and learning spaces envisioned herein would represent an extension of that posture. It would constitute recognition of the need for a construct fundamentally different from the standard. It would be clear evidence of the University's commitment to optimizing its faculty's ability to teach effectively and its students' opportunities to learn. The process which yielded this preliminary proposal for CaLS has been compressed; long-term development of the spaces will require broad outreach, diverse input, detailed planning, and carefully phased implementation involving many of the constituencies of the University community. It is important to understand that the availability of the space in Norton Hall was an impetus for discussion: the CaLS concept that resulted could lead to a pilot replicable in various locations throughout campus – within the Libraries, in living spaces, or on traditional academic classrooms and corridors.

## Describing the Spaces

### CaLS Purpose

The overarching purpose of CaLS should be to offer environments replete in opportunities for students to create and collaborate and for faculty members to leverage resources which extend the potential learning opportunities in their courses. The proposed spaces should be learner-centered. It would be a visible commitment to students – a recognition that they learn in their own ways and that they are seeking to legitimate the activities in which they engage everyday. Information technology (IT) resources for students and faculty are currently highly segregated – by discipline and by function – with most facilities targeting either broadly generic or highly specialized needs. CaLS could offer intersections of the capabilities of those facilities to enable interdisciplinary work and new uses of IT. The objective in creating CaLS should be to offer artifacts of understanding expected to address the knowledge acquisition modes of contemporary students. The learning spaces in most public universities, including the University at Buffalo, are very traditional – with ordinary unidirectional tools and capabilities using machine-mediated processes. CaLS should be designed to support the multimodal work of the members of the University community, particularly students who are underserved by existing public computing sites on both campuses. Given opportunity and resources, “digital native” students will effectively collaborate in modalities of which even they are not aware.

### CaLS Engagement Process

The actualization of CaLS must also be faculty driven, aligning students’ capabilities with faculty demands and expectations – a visible commitment that the University values teaching and will provide its faculty with the environments and tools needed to engage students and facilitate learning. Regardless of how learner-centered CaLS may be, it is critical that faculty be engaged on a parallel track in order for the spaces to be successful. It is not necessary for faculty to be expert in the technology available in CaLS; but significant education research suggests that it is essential that CaLS enable the learning experiences faculty members conceive when leveraging the capabilities of technology. Faculty will seize opportunities to challenge students to learn not only required content, but to actively seek broader and deeper knowledge. In this context, technology is merely the foundation on which faculty can layer new rich curriculum. If the outcomes are favorable, technology will be pedagogically integrated as a part of regular course design.

CaLS could build upon the University of Texas Austin’s Idea Center, which encourages teachers and students to “drop in” and discuss how best to engage students with new technologies and pedagogical techniques. Ideally, CaLS may encourage interaction between students and faculty reminiscent of traditional Greek and Roman education – a combination of both formal and informal spaces in which to engender ideas and learning. We have substantial internal evidence to reinforce what non-traditional and distributed education models already tell us – electronic forums create *more* and *richer*

interactions, rather than less. Faculty members who use these tools effectively find themselves incorporating new strategies to manage these interactions both in and out of formal class time.

CaLS should support establishment at will of new virtual spaces/groups for collaborations and discussions, thereby enabling participation independent of co-location in a fixed facility. Such immersive virtual spaces – empowered by Internet2 and Web 2.0 capabilities – will serve as social bridges spanning overlapping spaces where students and faculty members can work together. The underlying need is for real, not just virtual spaces –equipped with the devices and infrastructure (including access to a diverse and rich store of audio, video, still image, text, and other content) essential to the collaborative and learning activities envisioned.

The assumption of a positive UB faculty and student response to these spaces is not speculative, but based in part on findings of the *2007 Student IT Survey*, and *Faculty Teaching with Technology Survey* which focused on the types of devices used, how they currently connect with University resources and how technology and pedagogy could be more effectively linked. Student comments (several questions focused on learning space technology) reported strong demand for functional collaborative spaces. The survey also reinforced our informed understanding of what students want and/or need, including:

- access to resources through robust, predictable wireless connections;
- wireless access in Library Commons, Residence Halls and student gathering places (including hallways and food courts);
- pervasive power outlets for laptops and portable devices;
- spaces where they can easily be located by friends and group members;
- privacy for conducting group work, even when in semi-public spaces;
- comfortable, reconfigurable furniture;
- room to spread out materials; and
- readily accessible printing.

### **Faculty Statements of Curricular/Instructional Innovation with CaLS**

Faculty offered extensive comments both in the baseline teaching with technology survey and in a number of internal focus groups regarding collaborative classrooms and learning spaces. Generally, faculty expressed a desire to move into a Web 2.0 enabled world to take better advantage of idea-generation, brainstorming, and real-time student

manipulation of models and simulations. When specifically probed about how best to utilize a CaLS pilot space, one engineering faculty member suggested:

*In my sophomore product dissection course of 200 students, a CaLS would enable work groups in augmented reality domains by integrating physical and virtual environments to study engineered products, component function and form, and manufacturing processes. Students would leverage an augmented reality - where they are physically co-located - by digitally interacting and archiving projects through wiki reports and digital product assembly simulations. Further, with Wii-like haptic devices, student groups could replicate a product rip-down in a virtual domain and compare that process and resulting insights with their physical rip-down processes. These experiences in a collaborative learning space would create pedagogical opportunities to marry physical and digital instruction initiatives by providing active, leading-edge cyber-enabled experiences.*

A more general description of how faculty would use CaLS was articulated in a teaching, learning & technology (TLT) focus group subsequent to the 2007 faculty and student surveys:

*Students can listen to a podcast to view a demonstration of how to solve differential equations, but they can't accomplish much during class time - they need to leave, engage in homework and come back for further instruction. I want them to go further than they can with pencil and paper in the classroom. A clicker won't get me there. We need interactive environment to monitor, correct and display examples in a collaborative environment with students. Access to these spaces is not necessary every week, but it would be incredibly helpful to be able to schedule collaborative spaces in response to certain instruction modules. Additional modules could be developed once tools, practices, professional development and CaLS are more broadly adopted on campus.*

Modeling and simulation may vary in construct depending upon academic discipline. When envisioning CaLS, there may be a tendency to focus narrowly on advanced technology as present in the sciences, yet internal UB research reinforces ECAR and other national data that collaborative spaces serve multiple disciplines through use of similar collaborative teaching and learning tools. One instructor indicated that the School of Social work would benefit by:

*Entering a suite with 5-6 configurable spaces set up with different tools depending on what I need for class that day – for example, video capture and playback for skills training. I'd like to block out the time, use it, and have students post the output to later access, discuss and manipulate for additional scaffolding.*

Once captured and employed, new server based tools would allow for advanced annotation and coding of video, where artifacts are then stored and shared potentially across groups of students, or even disciplines. One faculty member indicated that CaLS could enhance departmental productivity when instructors build upon each others' course preparation work and share learning objects and tools within the same discipline – building advanced searchable knowledge bases that could then be drawn upon for later research and conference presentations.



## Planning the Spaces

CaLS should be approached as nascent learning spaces, evolving as planners better understand the uses to which they will be put. Unpredictability is integral to success. As planning evolves from the purely philosophical to concrete inquiry regarding the “look and feel” of the spaces (both in the physical and virtual sense), a staged roll-out of facilities and functions will allow flexibility while creating innovative spaces worthy of serving as models for other universities. CaLS must be adaptable to a broad variety of academic and stylistic needs, and any discussion attempting to narrowly define end user needs at this juncture may be counterproductive. These spaces and the needs they serve change rapidly due to the many ways in which students engage (and find ways to re-engage) with new technologies. Thus, rollout plans should be malleable, responding to the direction set as faculty and students use and help to define the spaces. Building of CaLS should be based on a phased rollout plan with concomitantly staged funding. Further, it is essential to ensure that the spaces are sustainable. They will need staffing, background infrastructure, and ongoing, timely maintenance and refreshment. This will entail a commitment which goes far beyond what’s provided in public computing spaces now. Failure to support the continuing requirements of CaLS will result in eventual failure to fulfill the expectations they will inevitably engender.

To plan CaLS in detail, it will be necessary to develop a better understanding of possible uses, to articulate concrete notions of the specific kinds of activities in which students will engage provided resources, and to ensure compatibility and integration with other plans under development which address similar concerns – specifically regarding transformation of certain library spaces. To do this effectively, the planners will have to progress from thinking “out-of-the-box” to being unconstrained by the construct of “the box.” As the data suggest, the design of CaLS should proceed from the precept that the environments will be a neutral enabler comprised, largely, of non-specific spaces. Overall the spaces should be low density, easily accessible, supportive of limited *ad hoc* reconfiguration, and focused on its unique characteristics. Planners must also understand and specify the infrastructure (network, servers, storage, etc.) which will be needed to support CaLS. Finally, the budgetary requirements not only to build CaLS, but to maintain the spaces and their infrastructure (including regular refreshment of equipment) must be fully explicated during the planning process.

CaLS should be open, airy, inviting, engaging, comfortable, colorful, flexible, and innovative (meaning that they promote inventiveness). Everything about the spaces should encourage and enable content creation and manipulation. The learning curve to use the facilities should not – for the most part – be an impediment to their application; that is, the technology should be transparent to the greatest extent possible. CaLS should be platform agnostic – also to the greatest extent possible. The collaborative capabilities of CaLS should model real world collaborations. Teaching and learning capabilities should reflect the learning preferences and styles of contemporary students. CaLS should leverage multi-media resources and network-enabled interconnectedness in well integrated and easy to use interfaces.

Above all else CaLS should be learner-centered. For that reason and to ensure their appeal, relevance, and usability, students must be involved in planning every aspect of their design. Detailed design of CaLS should include input from faculty, students, and information technology and library staff. Faculty members often want students to experience a process with a targeted learning outcome in mind; if the designers of CaLS are not aware of those processes or outcomes, the right technology may not be made available. Students often have ideas about how to use learning spaces which differ significantly from the conceptions of the designers of those spaces; again, if the designers of CaLS are not aware of those ideas, the right technology may not be available. In fact, CaLS could be described as venues for organized opportunities.

It is expected that CaLS will consist of a mix of interdisciplinary spaces with some commonalities, serving the many uses to which it will be put. Recognizing that the “new” minds of students are unbounded, CaLS should offer assessment and development tools in flexible environments intended to enable students to achieve understanding, explanation, and creativity. The primary attributes of CaLS should be:

- flexibility, including reconfigurable furniture and spaces; and
- ease of use – facilities without steep learning curves whenever possible.

Diverse content in many forms should be available for development and reference applicable to creation, scholarship, and pedagogy. The sum effect of the facilities in CaLS should be intended to offer a basis for sharing knowledge, process, and creativity. They should foster the core activities which advance the teaching mission of the University.

Some preliminary ideas about the general features of CaLS include.

- 24/7 availability with online scheduling and reservation procedures;
- a mix of public and private spaces;
- fluidity enabled, for example, by offering variable lighting and seating and by exploiting wireless technology;
- an online collaborative infrastructure to support the many potential uses of the space; and
- an environment which fosters convocation of students and faculty members.

The resources available in CaLS probably should include:

- moveable and configurable lecture lectern(s);
- open spaces plastic enough to host a variety of activities and interactions;

- mini studios which have full multimedia production capability (including some instruments);
- a soundproof room for voice-over activity;
- ready access to coursecasts, courseware, wikis, iTunesU, and collaboration and presentation hardware/software;
- licensed software to support the collaborative and creative activities which are fostered by the capabilities of the environment;
- check-out notebook computers, microphones, video cameras, music keyboards, etc.; and
- kiosks/monitors displaying work underway.

Planning of CaLS should be conducted as a meta-interdisciplinary research project: study the spaces and their uses, see what works best, and continue to develop them. The most important component is the underlying vision, expressed in terms of serious outcomes which are sought. It is also important to understand the concrete uses and purposes of the spaces. Planning for any one CaLS is transportable to other locations; it need not be fixed on the space currently under consideration. In fact, deliberations regarding CaLS should be coordinated with other similar discussions underway in the University, such as those about the Libraries (and Lockwood Hall in particular). The desired outcomes should include scalable solutions which can be replicated and customized to accommodate other campus spaces. It is expected that the planning methodology proposed for the CaLS will be one of the useful products of this effort – transportable, scalable, and responsive to actual needs.