From Commons to Classroom: The Evolution of Learning Spaces in Academic Libraries

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Over the past two decades, academic library spaces have evolved to meet the changing teaching and learning needs of diverse campus communities. The Information Commons combines the physical and virtual in an informal library space, whereas the recent Active Learning Classroom creates a more formal setting for collaboration. As scholarship has become increasingly digital and interactive, commons and classroom environments in academic libraries promote experimentation with new technology and accommodate millennial learning behaviors. The library, a centrally located and academically neutral campus space, provides an ideal place for classrooms and encourages interdisciplinary scholarship unbounded by specific academic departments.

Introduction

The research library will survive *because* of the introduction of ever more and newer digital technologies, not in spite of them (Frischer, 2005, pp. 42-43).

At a 2002 Council on Library and Information Resources (CLIR) Sponsors' Symposium, Bernard Frischer spoke about the not-so-distant future—the year 2012. He projected that instead of sitting in brick-and-mortar classrooms listening to lectures, students would find themselves in theaters, "right in the middle of the subject of their study" (Frischer, 2005, p. 41), and, more importantly, right in the middle of the library, as chemical reactions and archaeological digs would virtually come to life in front of their eyes. While such a vision may have seemed innovative in 2002, a little more than a decade later, Frischer's projections have become realities. Libraries have begun to incorporate virtualization spaces like Frischer's Cultural Virtual Reality Lab at UCLA, such as Texas Tech University Libraries 3D Animation Lab (Sullivan, 2003; Dougherty, 2009). Frischer's more emphatic point, however, which will be taken as the point of departure

for this article, involves the academic library's survival and relevance "*because*" of digital technologies, not "in spite of them" (2005, pp. 42-43).

Scholars and librarians alike have long examined the library's role in the dissemination, cultivation, and preservation of digital information. In 1999, historian Gertrude Himmelfarb's telling article "Revolution in the Library" tackled the issue of how academic libraries had begun to negotiate electronic sources within traditional collections. Most importantly, librarians have grappled with the question of how to attract students to the library as a place to not only retrieve digital information, but also to discuss and apply it to their classroom and learning experiences. In the early to mid-1990s, what would officially become known as the Information Commons ("IC") helped to bridge this gap between physical and virtual spaces. The academic library has since evolved as a place to experiment and gain confidence with technologies, obtain information, and shape learning as an interactive process.

This essay will trace the evolution of collaborative learning spaces in academic libraries, including Information Commons, Learning Commons, and more recent Active Learning Classrooms, especially through the lens of a new Collaborative Classroom at the University of Pennsylvania Libraries ("Penn Libraries") Van Pelt-Dietrich Library Center ("Van Pelt Library"). These various spaces in the library work together, as Commons spaces have provided libraries the confidence to take on more formal learning spaces like classrooms. Moreover, such spaces emphasize that libraries continue to claim their spot as intellectual and cultural hubs on campus by responding to users' evolving needs and implementing the technologies to do so. Ultimately, academic libraries provide collaborative areas that both students and faculty increasingly view as convenient, comfortable, flexible, and, most importantly, productive, in meeting teaching and learning objectives across academic departments.

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Evolution of the Information Commons

As libraries have transitioned from housing solely paper-based collections to offering computing resources and electronic information over the past fifty years, many have voiced concern regarding the relevance and survival of academic libraries in the information age. New computing technology has required physical changes to the library as well as increased staff training in the areas of cataloging, circulation, and acquisitions (Molholt, 1985). In the 1980s, the term "information support center" described the academic library's new role in assisting users with finding electronic information (Molholt, 1985, p. 285). Digital information has greatly influenced the services that academic libraries perform and how libraries assist patrons in an ever-developing digital society. As intellectual and technological progress has gone hand-in-hand (Himmelfarb, 1999), the academic library has been called upon to accommodate these interconnected needs.

Although the term "Information Commons" did not surface until the early 1990s (Steiner & Holley, 2009), the IC was developed precisely to address the "electronic revolution" that libraries witnessed in the 1980s and 1990s (Himmelfarb, 1999). Conceived under various labels, including the "Information Arcade," the "Media Union" and the "Virtual Village" (Steiner & Holley, 2009), the "Information Commons," as both a term and a concept, provided academic libraries with a new model for offering assistance to users. In its early days, the IC was very much focused on two services—technology, or "conceptual space," and facility, or "physical space" (Beagle, 1999, pp. 83-85). These spaces merged in the IC to create a distinct area in the library for information referral, expertise, and user collaboration. Conceptual and physical spaces remain two essential features of ICs today; moreover, the IC has evolved to meet learning needs for a variety of users, not only undergraduates, but also graduate students, continuing education students, and community members who use the library.

The Information Commons has received much attention as academic libraries have been forced to adapt to rapidly changing technology and to remain relevant to users as places for information retrieval. From early notions of electronic information's role in the academic library (Molholt, 1985; Himmelfarb, 1999), scholars and librarians have focused on how the IC best processes and disseminates information to its users in cooperation with other academic units. The "one-stop shopping" model (Spencer, 2006, p. 244), for example, emphasizes the IC as a multipurpose space, where walk-in assistance, media services, and reference help is available (Beagle, 1999). Most importantly,

ICs have created alliances with academic units and departments, including writing or study skills centers, which promote interdisciplinary work and interdepartmental cooperation (Beagle, 1999; University of Pennsylvania Libraries, 2011). Such academic partnerships have urged faculty to utilize the IC as an optimal space for interactive teaching. These IC uses have paved the way for more and diverse learning spaces particularly in the academic library as a central intellectual locale on campus.

Although many laud the IC's "continuum of service" model, which includes research guidance, instruction, technology, and flexible physical space (Bailey & Tierney, 2002, p. 277), others have pointed to the challenge of training staff to meet both technological and research needs that the IC demands (MacWhinnie, 2003). IC staff members often wear many hats—from troubleshooting technology to providing software advice to teaching workshops—all while maintaining a strong public service presence. These services not only place a drain on IC resources (Bailey & Tierney, 2002), but also can dislodge an IC's founding ideals from its everyday practices (for example, focusing on one user group to the exclusion of another) (Heitsch & Holley, 2011). To ameliorate these issues, new Commons models, including the Learning Commons and, as will be examined, the Active Learning Classroom, have shifted the focus onto spaces that facilitate teaching and learning, as library and academic departments collaborate on student achievement.

Learning-Centric Outcomes in the Commons

The Commons model often presents a tension between developing a facility that promotes both the "library as place" ideal (Spencer, 2006, p. 244), and a virtual library, where digital services render the physical library superfluous. A focus on reference service in the mid-2000s offered a bridge between the physical and virtual Commons space. Beagle referred to this shift in terms of the "Internet2" Commons (2002, pp. 288-289), or a virtual Commons that integrates bibliographic instruction, research, writing assistance, and media services through online guides and tutorials, while still emphasizing the physical Commons as a place for obtaining assistance with such resources. By the mid- to late 2000s, the physical-virtual tension, in addition to the role of more traditional reference services in the IC, made way for a distinction between the Information Commons and the Learning Commons ("LC"). Unlike the IC, the LC brings users together for collaboration on specific learning goals, geared toward the mastery of particular course-based tasks (Wolfe, Naylor, & Drueke, 2010). In the LC, reference librarians become essential for providing bibliographic and research instruction (Beagle, 2002), but are also frequently required to provide services other than reference, such as

technology support (Steiner & Holley, 2009). Steiner and Holley (2009), like other researchers, have discussed the challenge of staff training to meet varied user needs, and the threat to the "traditional" library that such a Commons poses in an academic library (Gayton, 2008).

Catering to users' learning habits in the Commons (whether IC or LC), in conjunction with larger institutional missions and goals, has created greater support for academic libraries and departments working together to adhere to students' particular learning behaviors. For example, Bennett discusses how design in learning spaces can foster "intentional learning," or the cognitive processes that lead to specific learning outcomes (2011, pp. 766-767). Additionally, involving multiple campus units in such learning space development ensures that fostering the most effective student-learning outcomes remains at the crux of the Commons' purpose (Steiner & Holley, 2009). Learning-centric Commons also promote e-literacy skills that best meet the learning behaviors of "net gens," or millennials, including a high reliance on technology and group collaboration (Beatty & White, 2005; Lippincott, 2012).

Both ICs and LCs have focused on the research that integrative learning and campus partnerships espouse via such learning spaces (Beagle, 2012). The Penn Libraries David B. Weigle Information Commons, for example, has attracted scholarly attention as a model Commons that both accommodates millennials' learning behaviors and works successfully with faculty to utilize the technological and physical resources that influence students' work (Vedantham & Hassen, 2011; Beagle, 2012; University of Pennsylvania Libraries, 2008). Like many Commons models (Wolfe et al., 2010; Beagle, 2012), the Weigle Information Commons partners with academic support services, such as the Marks Family Writing Center and Communication Within the Curriculum (CWiC), for students to receive help with writing or public speaking while studying in the Commons (Vedantham & Hassen, 2011, p. 3). Such partnerships for undergraduate success find ideal places in Commons, as they enable student services to expand on campus and allow the library to remain a vital part of student life. Commons usage not only highlights the academic library as a place that conducts innovative scholarship but also that affects the scholarly research that the academic institution as a whole produces.

The Active Learning Classroom

From the Commons, then, as a more informal space where such scholarship occurs, academic libraries have begun to reimagine the traditional classroom to further inspire the research that develops as a product of technology and innovative space. The connection among the IC/LC as a learning space, a place for campus collaboration, and the "cultural capital" produced as a result of work completed within the walls of the library (Halbert, 2010), has all contributed to the development of Active Learning Classrooms ("ALCs") since the early 2000s. ALCs have become popular features of libraries, both to provide new life for underused or outdated library spaces, and to reevaluate the ways in which collaborative teaching and learning occur, all in a flexible, high-tech library space conveniently and centrally located in the library. In more recent years, libraries, including the University of Iowa's (TILE Classroom) and Virginia Tech's (SCALE-UP classroom), have successfully implemented ALCs (Soderdahl, 2011; Virginia Tech, 2013); however, many of these classrooms have traditionally surfaced in the sciences, particularly in physics departments. For example, MIT's "TEAL" (Technology Enhanced Active Learning) Classroom opened as early as 2000 and North Carolina State University's "SCALE-UP Project" (Student-Centered Activities for Large Enrollment Undergraduate Programs) in 2007. At NC State University, Dr. Robert Beichner, a physics professor, sought to initiate a "highly collaborative, hands-on, computer-rich, interactive learning environment for large, introductory college courses" (Beichner et al., 2007, p. 1). Beichner's research stemmed from college science courses, in which lecture and lab had often become disparate elements of the same class. SCALE-UP classrooms are based on PER (Physics Education Research), research in NC State's Integrated Math, Physics, Engineering, and Chemistry project, and a National Science Foundation Grant (Beichner et al., 2007, p. 4).

Active Learning Classrooms are generally equipped with both collaborative space and high-tech features, including video screens, round tables (fitting three teams of three students each), three laptops (one per team), wiring for video plug-ins, and data cables (Soderdahl, 2011). The premise for such classrooms is based on student learning; moreover, students learn more when interacting with each other, the professor, and the materials in front of them than from a traditional lecture. Educational objectives in Beichner's SCALE-UP Classroom are based on "tangibles" (requiring observation/data collection) and "ponderables" (problems that are not well defined, i.e., students collaboratively searching for information) (NCSU, 2007; Beichner, et al., 2007, p. 11). In these classrooms, both attendance and conceptual understanding increase, learning attitudes improve, failure rates decrease, and performance improves in sequential classes (Beichner et al., 2007).

Many fledgling Active Learning Classrooms, such as MIT's and NC State University's, were built in science departments. It was not until the late 2000s that libraries began to experiment with such spaces, amidst existing

Information and Learning Commons. The University of Iowa's TILE Classroom (Transform, Interact, Learn, Engage), for example, renovated in 2010 from a general library classroom, sought to focus on student learning, not teaching, with no "front" of the classroom (Soderdahl, 2011). More importantly, Iowa, also one of the first institutions to experiment with the "Information Arcade" in 1992 (Steiner & Holley, 2009), sought to branch outside of the sciences and to apply active learning concepts to arts, humanities, and social sciences (Soderdahl, 2011). Iowa's TILE classroom was formed in the backdrop of a "student success team," which, in 2008–2009, focused on undergraduate retention rates as part of the school's strategic plan, and attempted to "create small communities in which first-year students could thrive" (Soderdahl, 2011, p. 84). Such classrooms as Iowa's, in conjunction with other library spaces, such as Commons and digital media labs, have created dynamic areas that showcase the library as a central campus locale for academic wellness (Soderdahl, 2011). As more of the campus community utilizes these adaptable, high-tech spaces, the academic library continues to assert its relevance to departmental and institutional scholarship.

Van Pelt-Dietrich Library Center's Collaborative Classroom

A dynamic relationship similar to that among Commons, classrooms, and media and digital humanities labs at the University of Iowa also exists among learning spaces at the Van Pelt-Dietrich Library Center ("Van Pelt Library"), the University of Pennsylvania's Humanities and Social Sciences Library. Adding to Van Pelt Library's interactive spaces, including the Weigle Information Commons, Vitale Digital Media Lab, and the Vitale Media Lab ("Vitale II"), construction is currently underway to renovate a space previously used for the government documents collection—a new Collaborative Classroom adjacent to the Weigle

Information Commons and the Reference area. The idea for the classroom stemmed from the Libraries' interest in creating more flexible and collaborative teaching spaces, especially in Van Pelt Library with its coveted resources and prime location on campus. This interest also reflected increased student and faculty attention on problem-based learning (*Almanac*, 2006). The Collaborative Classroom will house many features of ALCs in other academic libraries, including five round, six-person tables with projectors/flat screens and video signal sharing for multiple devices. An instructor's station will be located in the middle of the area, and there will be a "Porch" outside of the classroom, meant to be an informal collaborative space where students can break into groups (University of Pennsylvania Libraries, 2013). All furniture, with the exception of the tables, will be modular. When the classroom is not in use for teaching, it will be an open space for student collaboration and, potentially, library instruction.

Van Pelt Library's Collaborative Classroom will directly support undergraduate learning. Faculty enjoy teaching in Van Pelt Library; many take advantage of the technology available in the Weigle Information Commons Seminar Room, for example, and desire more library spaces to teach in ways that are most productive for student learning. While the Information Commons offers instructors and students more informal collaborative space, in the form of breakout Group Study Rooms and Data Diner Booths, the Collaborative Classroom distinguishes itself as a formal classroom space, albeit a modular and adaptable one. The classroom will offer flexible uses of technology, with small-group displays allowing for screen sharing within student groups and for instructors to project student work onto whiteboard walls. This technology will allow students to share digital resources, including library e-collections.

Significantly, the Collaborative Classroom will also provide a neutral space on campus where many departments can teach, which opens opportunities for cross-
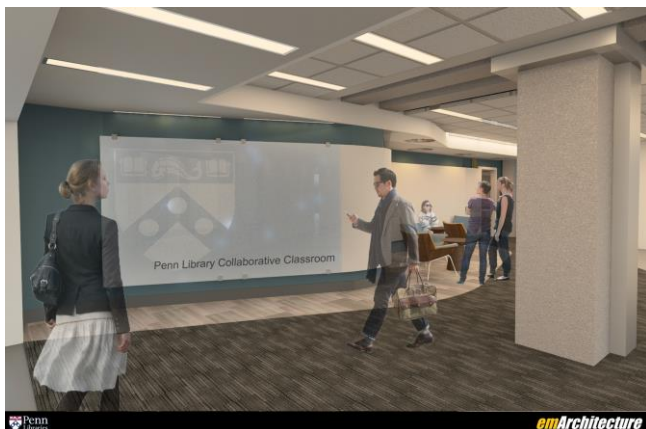

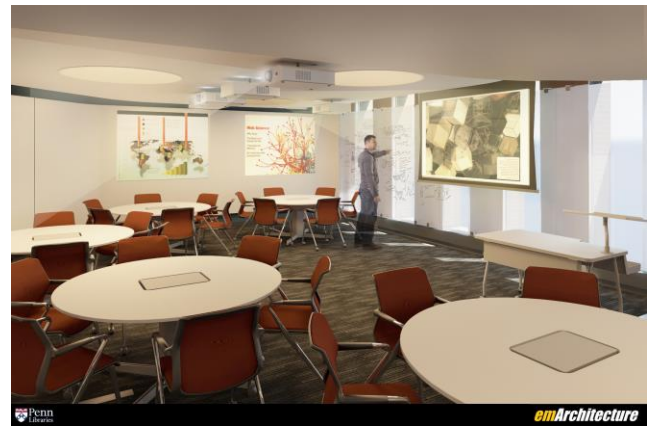**Figure 1. Porch Perspective. Copyright 2013 by EM Architecture.**

Figure 2. Classroom Perspective. Copyright 2013 by EM Architecture.

disciplinary partnerships. Faculty who teach in the classroom will have the opportunity to discuss which methods work best and which do not, as learning becomes more collaborative and less tethered to specific academic departments. Classes that would be ideal in the new classroom include science recitations with problem-solving exercises, a debate class where students work in small groups and present to the class, a critical writing seminar in which students workshop each other's essays, a programming course in which students develop code collaboratively on the whiteboards, and a language class where group conversations stimulate the room (University of Pennsylvania Libraries, 2013). Overall, the Collaborative Classroom provides faculty, students, and librarians alike with a space that not only creates a vibrant exchange with Van Pelt Library's other learning spaces, but also positions Van Pelt Library as a hub on campus, whose spaces support faculty's teaching and learning goals as part of the University's commitment to undergraduate education.

Conclusion

Over the past two decades, learning spaces in academic libraries have greatly evolved to meet both users' and institutions' needs, as changes in technology have influenced teaching and learning goals. The IC has adapted to such changes, from the physical and virtual environments that the IC has traditionally fostered, to how the IC best serves its multimodal users, to the kinds of academic research shaped by and promoted through Commons usage. In order to remain relevant in the library as an effective unit of academic scholarship and innovative research, the Commons must adhere to core ideals of serving a wide variety of users through multimodal approaches (Heitsch & Holley, 2011), keep open lines of communication with various campus units (Beagle, 2012), and maintain access to traditional library resources while fostering academic innovation (Halbert, 2010; Lippincott, 2012). Most importantly, academic libraries must continue to demonstrate to parent institutions that they play a crucial role in shaping university-wide scholarship; learning spaces discussed in this piece provide tangible examples of how Commons and Active Learning Classrooms meet this need.

In an effort to keep open lines of communication among various campus units, the Active Learning Classroom emphasizes the academic library as an impartial space on campus where departments do not feel as though they have to compete for resources. Such classrooms allow for cross-disciplinary partnerships unfettered from any particular department, and also open possibilities for librarians to embed themselves in courses. By using the classroom space for information literacy and bibliographic instruction,

librarians can engage in formative learning processes with students and work with faculty who value such learning methods. In this way, the library continues and will continue to serve as the metaphorical heart and physical hub of the campus for faculty and students, in addition to becoming a cultural and social center.

Collaborative learning spaces continue to strengthen the academic library's contribution to both campus wellness and research; however, they also must negotiate their place both among other interactive library spaces, including cafés, digital media and virtual reality labs, and special collections centers, and more traditional or "communal" study spaces in libraries (Gayton, 2008). While collaborative learning spaces will certainly continue to be focal points for many academic libraries, libraries must be careful that these spaces do not overwhelm areas for quiet contemplation and physical collections, both of which many students and researchers still seek in the library despite trends toward more active and digital learning. Although Frischer's 2002 prediction that libraries will survive "because" not "in spite of" digital technologies has certainly proven true (2005, pp. 42-43), libraries will have to consider tensions between traditional study and collaborative learning spaces to remain relevant to a diverse population of scholars.

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Supplement

The Collaborative Classroom in Van Pelt-Dietrich Library Center opened in January 2014 and is now one of six active learning classrooms at the University of Pennsylvania. Entering its sixth semester, the room has hosted a diverse range of humanities and social sciences courses, from disciplines including social work, theater arts, English and writing, criminology, German, Arabic, education, geology, and philosophy. When the classroom is not being used for teaching, it is open as study space, complementing the group study spaces just steps down hall in the Weigle Information Commons. In addition to courses, the room has hosted a number of library workshops and instruction sessions, special events, training sessions, orientations, and team exercises.

As more active learning classrooms have opened across Penn's campus, all have been larger spaces and most reserve priority for STEM courses. The Collaborative Classroom, which seats 30 students, attracts smaller-scale humanities and social sciences seminars and recitation sections, for which the focus is on discussion and peer learning. The room's location in Van Pelt Library allows for cross-disciplinary learning among faculty who may not otherwise interact, via showcase events and shared teaching resources. Unpublished feedback surveys from faculty who have taught in the space report that students engage more with each other when sitting at the 6-person group tables. Likewise, an overwhelming majority of surveyed students report that they feel more engaged in the Collaborative Classroom, and that being in the room has improved the peer-learning experience.

The Collaborative Classroom has positioned Penn Libraries as a crucial voice in the dialogue of teaching and learning at Penn. Faculty who use the classroom often work with the Center for Teaching and Learning (CTL) to participate in Penn's SAIL (Structured Active In-Class Learning) initiative. Faculty teaching in the room also receive guidance from Catrice Barrett, the Bass Family Teaching and Learning Fellow, who has managed the space since its opening. Catrice holds a doctorate in Educational Linguistics; her unique training has enabled her to be heavily involved in instructional design and assessment with faculty and students. Moreover, Catrice has worked to strengthen the library's partnerships with key campus players, including CTL and OLI (the Online Learning Initiative), to document the room's teaching and learning activities, including an activity bank for those interested in experimenting with active learning methods. Penn librarians have also been engaged with instructional design through an internal Teaching Interest Group, which meets monthly in the room.

Through the Collaborative Classroom, Penn Libraries has established itself as a key player in major campus initiatives in active learning. Output from the room, such as teaching resources, survey data, and student work, document collaborative learning from humanities and social sciences fields, which have been traditionally outweighed by STEM examples in active learning literature. The library's ability to both host and support such a space as the Collaborative Classroom enables it to be a teaching and learning partner with faculty and campus entities, and serves as a model for others seeking to develop collaborative teaching spaces in the library.