

The Emergent Information Commons: Philosophy, Models, and 21st Century Learning Paradigms

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ABSTRACT. *The learning support role of the Information Commons exhibits emergent properties characteristic of organizational learning theory. The literature review highlights four articles from the United States, one from Germany, and one from Japan to illustrate the issues involved. The philosophy of the commons extension across physical, virtual, and cultural domains and the development of the Learning Commons as a collaboration among multiple learning support units, including libraries, are traced from theoretical origins through real-world examples. “Integrative learning” is offered as one example of a 21st century learning paradigm being supported by such collaborations, as evidenced by the development of commons-based e-portfolio systems.*

KEYWORDS *Information Commons, information literacy, integrative learning, learning centers, Learning Commons, library reconfiguration*

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INTRODUCTION

In the first *Annual Report* issued by the David C. Weigle Information Commons (IC) of the University of Pennsylvania (2008), some of the most telling

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and persuasive commentaries come from teaching faculty. Dr. Valerie Ross (2008, p. 13), director of the university's critical writing program, offers one of several testimonials gleaned from the IC's online chronicle of "Success Stories":

The Information Commons is a superb space for collaborative learning. The resources are phenomenal, and the staff is friendly, helpful, and knowledgeable. Last year, many of my cinema studies students, working on collaborative film projects, relied on the multimedia staff for guidance on laying down sound and film editing. Some turned to the writing tutor for feedback on their screenplays and analyses. . . . This semester my Narrative Studies class meets in the Info Commons seminar room, an amazing base for a collaboratively-driven research-writing seminar. . . . Having laptops in the room, we can move with ease from discussion to writing, revising, and researching; having booths right outside the room, students can break out and work on their collaborative projects and peer reviews. I am astonished to see how the space and its services are transforming my teaching and my students as they continue to take greater control of the process and production of knowledge. At home in the library, increasingly prepared to avail themselves of the many resources and experts available to them, my students are becoming scholars.

We all understand that a media booth does not turn a student into a scholar—nor does a seminar room or even a writing tutor. But when these and other elements are combined within a reconceptualized service framework and projected onto a reconfigured library floor plan, the result can mesh with creative pedagogy to become something that seems greater than these constituent parts. This is a characteristic element of an *emergent phenomenon*. When Ross (2008, p. 13) states that she is "astonished to see how the space and its services are transforming my teaching and my students," the astonishment she describes is a reaction to the sometimes unpredictable nature of emergent phenomena, and is the subject of great interest within organizational learning theory. For example, in "complex work situations, environmental, technological, and organizational premises can facilitate patterns of working which cannot be [predicted] or prescribed by appealing to *a priori* plans and intentions" (McMaster, Wastell, Ferneley, & DeGross, 2007, p. 333). The emphasis Ross places on her students' *team* projects within the IC echoes observations by theorist Eve Mitleton-Kelly (2003, p. 42), whose book *Complex Systems and Evolutionary Perspectives on Organisations*, states:

. . . the generation of knowledge and of innovative ideas when a team is working together could be described as an emergent property in the sense that it arises from the interaction of individuals and is not just the sum of existing ideas, but could well be something quite new and possibly unexpected. . . . In the same way, organizational learning is an emergent property—it is not just a reification (giving objective

existence to a concept) but a process based on the interaction of individuals creating new patterns of thought. . . . When learning leads to new behaviors, then the organization can be said to have adapted or evolved . . . [organizations] need to facilitate learning and the generation of new knowledge—learning here does not mean just training or the acquisition of new skills, but the gaining of insight and understanding . . . learning and the generation and sharing of knowledge need to be facilitated by providing the appropriate socio-cultural and technical conditions to support connectivity and interdependence . . .

Over the 17 years since the University of Iowa’s Information Arcade opened, a growing number of academic library managers have sought to provide just such “socio-cultural and technical conditions to support connectivity and interdependence.” This effort has taken the form of the many new Information Commons (IC) and Learning Commons (LC) facilities on campuses across the United States and around the world. In parallel, there has followed an ongoing conversation in the professional literature and at conferences about the concepts and philosophy underlying the significance of the IC model (Table 1). In 1999, for example, I proposed the application of Strategic Alignment, a technology management theory, to describe how these facilities might help realign libraries with their host institutions in a time of technological change, and differentiate them from both traditional reference departments and generic computer labs (Beagle, 1999). This realignment involves the adoption of new knowledge media and the functional integration of new campus IT infrastructure, as well as the provision of group learning spaces that would align the library with growing faculty interest in constructivist learning approaches (team-based, group-process, resource-based, inquiry-driven, etc.). The IC potentially offers a “continuum of service” that can help the student move through and then beyond the established regime of information access and retrieval, through further steps

TABLE 1 Some Key IC Developments since 2000

Date	Event
April 2003	ACRL/Charlotte panel: “Information Commons: Issues & Trends”
May 2004	INFOCOMMONS-L listserv established
September 2004	University of Southern California Leavey Library Conference: “Information Commons: Learning Space Beyond the Classroom”
Spring 2005	Surge of international interest in U.S. IC developments; Beagle presents invited paper at Deutscher Bibliothekartag in Düsseldorf; Bailey presents invited paper at INFORUM 2005 in Prague.
Fall 2005	ACRL Information Commons Discussion Group established
Spring 2006	<i>Reference Services Review</i> publishes article series on IC
June 2006	First Annual Canadian Learning Commons conference
December 2007	International Conference on Information Commons & Learning Commons held in Hong Kong
Spring 2009	In Japan, Nagoya University’s <i>Annals</i> devotes special issue to ICs

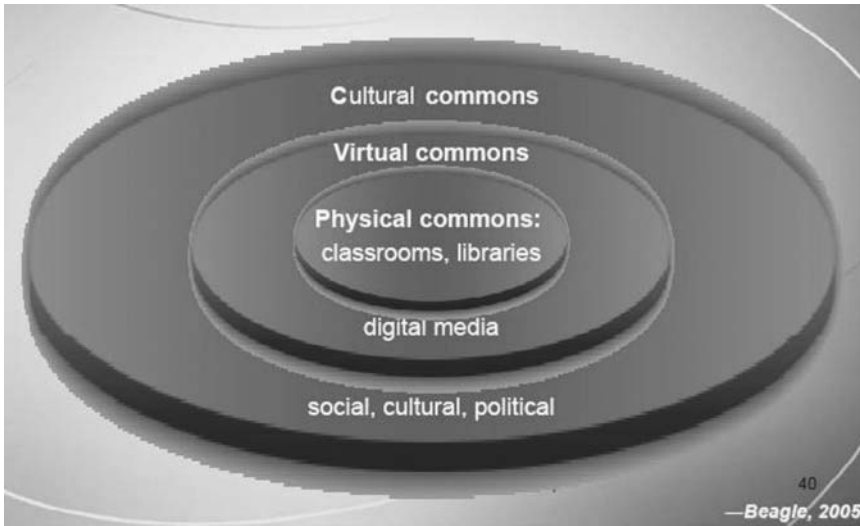


FIGURE 1 Three-Domain Diagram of the Commons.

of interpretation, processing, and manipulation, and on to the development, packaging and presentation of new knowledge. The term itself was viewed as having meaningful extensions on both physical and virtual levels or domains, a concept later expanded to include a third cultural or sociocultural level or domain (see Figure 1).

IC had already become the necessary and accepted collective noun for this class of facilities that were given a variety of locally-specific labels. As Bennett (2008, p. 183) notes: “... the words *academic*, *collaboration*, *teaching*, *technology*, and *media* often appear in names, along with or in the place of *information* and *learning*.” But it was clear from the statements of the library administrators who developed two of the earliest IC at the University of Iowa (1992) and the University of Southern California (1994) that learning support was always the primary mission. As the pace of new IC development quickened over the following years, the nature and implications of this expanded role of learning support became an ongoing concern of the scholarly conversation, as the following selective literature review since 2000 illustrates.

SELECTIVE LITERATURE REVIEW SINCE 2000

Since 2000, the IC’s ongoing emergence has reverberated beyond the library literature and reached the broader arena of literature about academic innovation. In the 2006 book, *Higher Education in the Internet Age*, Breivik and Gee (2006, p. 183) highlighted it as “one of the clear trends in library design ... to [have] libraries serve as learning and social centers ... one-stop shopping to seamless integration of high-tech and high-touch.” The

following year, Duke University Press issued an updated edition of *The Academic's Handbook*, with an essay on "The Modern Research Library" that introduces the IC model to the book's target audience of readers contemplating careers in academia. "Colleges and universities throughout North America increasingly are creating information commons because they present their communities with service models that can transcend the traditional boundaries between reference and technology support in libraries, on the one hand, and between library and campus technology operations on the other" (Jakubs & Conway, 2007, p. 343). The dynamism of IC development and student acceptance has also drawn the attention of the popular academic media (*Chronicle of Higher Education*, *Campus Technology*), and popular news media (*Wall Street Journal*).

Within the arena of library literature, presentations, articles, and books on the role and status of the academic library now routinely include at least an obligatory nod to the IC and LC phenomenon, with Hisle (2005, p. 6) and Budd (2005, p. 153), being examples. The range of learned journal articles devoted specifically to the IC model has grown beyond the scope of this article, but a scan of the literature reveals (1) narrative reviews, giving a chronological overview of IC developments; (2) conceptual essays, describing central ideas, assumptions, and principles; (3) site profiles, describing individual campus IC installations and operations; (4) component studies, looking in greater detail at particular functions or units within IC, such as reference services or staff training and development; and (5) various combinations of the above. Among narrative and conceptual essays, for example, MacWhinnie (2003) provides an insightful conceptual overview with some narrative elements. Spencer (2006), whose article introduced a special *Reference Services Review* article series on IC, condenses chronology and some characteristic guiding ideas into a concise and effective essay. Articles following Spencer in the *RSR* series are excellent examples of site profiles. Interesting site profiles from beyond the United States have included contributions by Mountifield (2003) and Degkwitz (2006).

Of special interest to a consideration of learning paradigms rooted in organizational change are those component studies that focus on staff learning, student learning, focal points of service delivery, and job redefinition. Beatty and White, for example, argue that the IC offers support for formal learning through on-site classrooms and e-literacy instruction (with e-literacy viewed as combining information literacy and IT literacy); support for informal learning through face-to-face reference interactions, group study rooms, and social areas; and support for self-directed learning through virtual instruction (Beatty & White, 2005, p. 6). And what about staff, faculty, and the organization as a whole? To appreciate the many aspects of organizational learning support implicated in IC and LC development, along with the personnel issues that are frequently among the most challenging in library administration, consider the following four examples.

1. Cowgill, Beam, and Wess (2001, p. 433) looked at the staff learning necessary to support “scholarship [that] involves a continuum from initial research through the final project.” Their paper about IC development at Colorado State University (CSU) remains one of the best overviews of how staff training and technology competencies can be retooled to support a tiered service model where librarians and technical assistants work from a single service desk. The original CSU IC did not replace the existing reference area but was situated in another location in the library, with both reference and IC desks staffed by librarians, paraprofessionals, and students. In the years since, the reference desk per se has been retired, and CSU librarians have moved off the desk to an in-office referral system, with many of these referrals coming via a merged information, research, and IT support desk in the IC staffed solely by paraprofessional and student employees. As this article is being written, CSU is finalizing plans to merge the IC’s information desk with the campus central computing desk. Central computing staff will then handle IT support questions, and library paraprofessional and student workers will handle information and basic research queries and will continue to make referrals to librarians’ offices when warranted (L. Wess, personal communication, May 31, 2009). Thus, CSU has also become an interesting example of how an adaptive organization recalibrates its pattern of service as it learns more about the changing needs of its constituents and as emerging technologies reshape its infrastructure.
2. We find a contrasting example at the University of Massachusetts–Amherst (UMass), where Fitzpatrick, Moore, and Lang (2008, pp. 235, 237) carried out an impressive survey of reference services within the Du Bois Library Learning Commons, revealing a high level of student satisfaction with a specialized Reference and Research Assistance Desk (RRAD). At UMass, IT problems are not “tiered” to technical assistants at the same desk, but are handled at a nearby service point, leaving librarians at RRAD free to focus on helping students learn necessary research skills. “A striking finding was how highly students valued learning the research process during the reference interaction . . . the data show that users value the teaching aspect of the [reference] interaction the most. ‘Learning the steps’ allows them to become more independent researchers.” These findings echoed my IC planning work at the University of North Carolina Charlotte (UNCC) in 1997–1999, when the initial decision was made to retain specialized reference, information referral, and media services desks in a cluster. The need for librarians to bring uninterrupted focus to desk interactions as teachable moments was seen to justify the logistical challenge of staffing a separate info-referral service point, and a similar learning priority applied to the media desk. This schema viewed reference and media desks as potential funnels that could draw some students beyond the level of Q&A to enroll in research skills instructional sessions and media presentation

skills seminars, respectively. The key point to be stressed in the context of the varied models evident in the CSU, UMass, and UNCC examples is that the pivotal choice between the tiered single-desk model and the multiple-service-point model may initially seem to turn on budget and logistics, but ultimately the success of either model hinges on the effectiveness of the library's approach toward *learning*: staff learning, student learning, and their interweaving within the larger fabric of organizational learning. Examples of methodologies for increasing that effectiveness are discussed in the articles by Boyd (2008) and Somerville and Collins (2008).

3. The linkage between individual and organizational learning in a commons comes to the fore in an article by Boyd on job redefinition. Boyd (2008, p. 237) applies precepts of Industrial and Organizational Psychology to explore the use of organizational analysis, and within that framework, systematic job redefinition: "the process of collecting information, observing the function, to note the conditions in which the work is performed . . . a thorough job analysis articulates the knowledge, skills, abilities and other characteristics (KSAOs) which are required to perform the job." In other words, the analysis constitutes a process wherein the organization learns about its various operational components and the staff members who personify and implement them. Boyd notes that while knowledge and skills (KS) are obviously vital, their specifics are frequently transitional due to the rate of IT innovation. Therefore it is the "abilities and other characteristics" (AO) of librarians and support staff that appear to be rising in relative importance as IC's establish themselves. These include "the native ability to grasp new concepts and material quickly . . . an ability to build and apply new knowledge . . . a talent for sharing knowledge effectively . . . to help others and . . . collaborate in a team setting . . . [and] a willingness and eagerness to remain current with emerging ideas, concepts and technologies" (p. 238). And because those "emerging ideas, concepts and technologies" are ongoing and sometimes unpredictable, this type of structured organizational learning should occur on an ongoing basis or at regular intervals.
4. An article by Somerville and Collins (2008, p. 810) sets forth a collaborative codesign process that, in effect, extends the organizational analysis to students and faculty, where the "jobs" of students are defined through questions such as "1) How do students study/learn? How do they solve problems? 2) How do students use technology and share information? 3) How do students produce content and 'make knowledge?'" The planners "purposefully incorporated learner-centered social interactions into a library re-design process intended to insinuate librarians into students' information finding, knowledge gathering, and content creating activities. Toward this end, they selected Web 2.0 tools for collaborative investigations with student and faculty beneficiaries" (p. 804). By comparing collaborative codesign efforts at San Jose State University and California Polytechnic

State University (Cal Poly), the authors show how students and faculty can become full stakeholders in the library redesign process by using the same Web 2.0 tools that IC and LC facilities would subsequently incorporate and facilitate: “Students also recommended a virtual as well as a physical commons. For example, students in software engineering and artificial intelligence courses responded to student-generated needs assessment findings and created prototype learning spaces and learning tools for the Cal Poly learning commons using 3D-modeling techniques. Then they conducted user studies employing focus groups, online surveys, and usability experiments. Their applied research projects explored many learner-centered virtual enhancements to the original teacher-focused design concepts . . . [these] ideas stimulated planners’ reconsideration of their original design assumptions and underscored the importance of heightened boundary crossing collaboration” (p. 810). The collaborative codesign techniques described here and in other articles coauthored by Somerville (2007) have perhaps not received the same level of attention as has the ethnographic approach popularized by Foster and Gibbons (2007), although the two are not mutually exclusive. But this methodology of meaningfully interlinking physical and virtual domains of organizational learning may be especially apropos to the development of IC and LC initiatives that will ultimately extend service delivery across both domains.

Learning support also underlies important IC and LC research beyond the United States. Christine Gläser (2008) of HAW Hamburg (University of Applied Sciences) has been conducting comparative research on IC in continental Europe and the United Kingdom, compiling best practices for supporting IC technological literacy and lifelong learning. Integrative learning and group knowledge building in the context of the commons have also become the focus of interesting work by Haruki Nagata (2009) of Japan’s Tsukuba University. Nagata is developing a line of inquiry into IC and LC spaces as instantiating the Japanese concept of the *ba*. As described by Nonaka and Konno (1998, p. 40): “*ba* can be thought of as a shared space for emerging relationships. This space can be physical (e.g., office, dispersed business space), virtual (e.g., e-mail, teleconference), mental (e.g., shared experiences, ideas, ideals), or any combination of them. What differentiates *ba* from ordinary human interaction is the concept of knowledge creation. *Ba* provides a platform for advancing individual and/or collective knowledge. It is from such a platform that [the learner] integrates all information needed.” While the *ba* has roots in the epistemology of the Kyoto School, it has proven a promising framework for the contemporary study of organizational learning. Dai (2004), for example, used *ba* to examine innovation at Japan’s largest provider of mobile telephone service. Nagata especially relates the description of the commons on physical, virtual, and cultural levels in the three-domain diagram in Figure 1 to the physical, virtual,

and “mental” aspects of the *ba*, with “mental” not limited to any individual experience, but extended to the emergent properties of group-process and shared-experience organizational learning (H. Nagata, personal communication, May 18, 2009).

The passage of years and the scope of IC development on many campuses have now afforded enough perspective for some authors and editors to offer more expansive treatments, resulting in a handful of specialized monographs. These, overall, also reflect the emphasis on learning support. Bennett’s (2003) *Libraries Designed for Learning* sets the IC and LC movement within the context of trends in academic library design, rooted in the long tradition of academic commons, and within the long-term shift in emphasis from teaching to learning. He asserts that the library commons’ design should “incorporate a deeper understanding of the independent, active learning behavior of students and the teaching strategies of the faculty meant to support those behaviors” (p. 39). The EDUCAUSE monographs *Educating the Net Generation* and *Learning Spaces* include widely-read chapters by Lippincott (2005; 2006) that advocate “linking the commons to learning” (2006, p. 7.2) and that relate IC development to the needs and expectations of students from the net generation. In 2006, *The Information Commons Handbook* elaborated on conceptual elements from my earlier articles, such as functional integration and strategic alignment, while also relating commons development to various rubrics of information literacy, the development of learning communities, and Web 2.0 innovations (Beagle, 2006). The *Handbook* presents an IC planning framework that incorporates scenario building, focus groups, and a structured campus conversation through which IC planners can learn about student and faculty needs and desired outcomes. This framework was subsequently validated by the sabbatical research of McMullen, who visited some 18 IC facilities across the United States. McMullen’s (2007, p. 3) final report concluded: “Using much the same planning process described by Beagle, these IC/LC planning committees drafted charter documents that were instrumental in moving their project forward.” These and related approaches to planning, implementation, and assessment were further explored by Bailey and Tierney (2008) in their ALA Editions book, *Transforming Library Service through Information Commons*. Bailey and Tierney also reiterated and expanded on the relationship between the IC model and the Association of College and Research Libraries (ACRL) standards for information literacy: “It may be helpful to conceive of information literacy as the curriculum information professionals teach within the IC framework. Information literacy and the information commons are complementary organizing principles . . . reminiscent of Benjamin Bloom’s 1956 taxonomy of educational objectives” (p. 6). Somerville and Harlan (2008) offered another conceptual overview of IC and LC development in their introductory chapter of *Learning Commons: Evolution and Collaborative Essentials*, placing even greater emphasis on the theme of the IC’s

evolutionary passage from technology adaptation to learning support. This book, edited by Schader, also brought much-needed renewed attention to ongoing international developments. Two other monographs, the 2004 ARL SPEC Kit 281, *The Information Commons* (Haas & Robertson, 2004) and *A Field Guide to the Information Commons* (Forrest & Halbert, 2009) are expertly-edited compendia of descriptive overviews of various IC facilities, prefaced by sets of largely practical essays. But the importance of the conceptual and theoretical discussion carried forward in four previously mentioned core monographs becomes most evident when we turn to the question of perceived or defined differences between IC and LC, and the possible evolutionary or developmental path from the former to the latter, a path that may both reflect and anticipate the development of new learning paradigms.

INFORMATION OR LEARNING?

As IC's continued to proliferate at the start of the new century it became clear that not all were equally positioned within their respective campus environments. Some remained library-centric, serving primarily to facilitate access to, and exploration of, the widening array of aggregated databases, Web-based resources, media tools, and productivity software becoming available. Others fulfilled this role and moved well beyond it, becoming components (and sometimes hubs) of campus-wide initiatives to encourage teaching and learning with technology and collaboration among (or colocation with) learning-support units such as academic skills and tutorial centers, writing centers, and faculty development programs. A key question emerged: would IC fall into two distinct groups at either extreme in a statistical range that might resemble a barbell on a graph, or would the range instead come to resemble the classic bell curve, with most IC having some moderate or intermediate level of collaborative activity and engagement?

In early 2004, with planning under way for the first IC conference to mark the 10th anniversary of USC's Levey Library and its constituent IC, the curve of IC development still seemed too formative to enable a valid survey to distinguish between the barbell and bell-curve scenarios. But in an attempt to lay the groundwork for future study, I prepared a brief "thought piece" or white paper for posting at the conference Web site and invited further comment and discussion (Beagle, 2004). This brief included a matrix introduced in a large-scale study of academic change initiatives sponsored in the 1990s by the American Council on Education (ACE; see Eckel, Green, Hill, & Mallon, 1999, p. 15). Researchers with ACE had produced a typology of change initiatives with graph lines representing the *depth of change*, in terms of fundamental impact on basic activities and assumptions, and *pervasiveness of change*, in terms of extent and distribution of influence across the institution (Figure 2). The top quadrants, "adjustment" and "isolated change,"

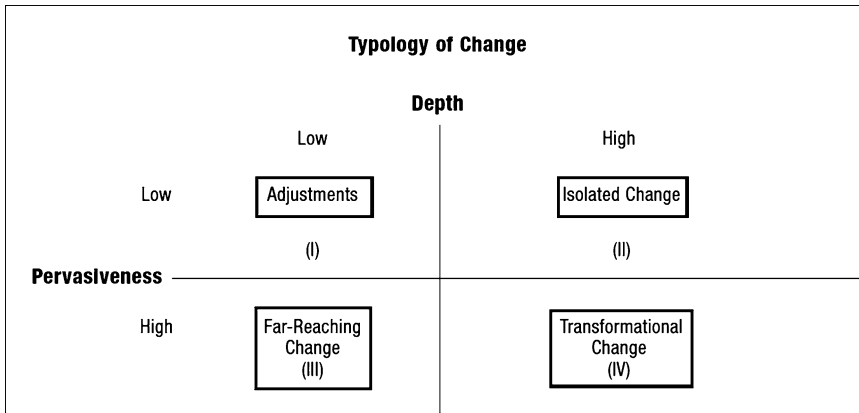


FIGURE 2 Typology of Change (P. Eckel, M. Green, B. Hill, & W. Mallon, 1999).

would mark the ability of IC to distinguish themselves to greater or lesser degrees from library-based computer labs. The bottom quadrants, “far-reaching change” and “transformation,” seemed to warrant another collective noun, and so LC was proposed for these. The brief also suggests that the same ACE matrix might be used to characterize a possible developmental path or phased evolution from IC to LC. The ACE matrix schema is elaborated in *The Information Commons Handbook*, along with the following proposed working definitions (Beagle, 2006). The IC is defined as “a cluster of network access points and associated IT tools situated in the context of physical, digital, human, and social resources organized in support of learning” (p. xviii). The IC becomes an LC when its resources are “organized in collaboration with learning initiatives sponsored by other academic units, or aligned with learning outcomes defined through a cooperative process” (p. xviii).

Over the following years, the “thought piece” did prompt ongoing discussion. In one widely-noticed presentation, for example, Cowgill & Wess (2006) rearranged the matrix components by flattening them into a line that made more direct visual reference to the proposed developmental path (see Figure 3). Accordingly, on some campuses, libraries that first successfully implemented IC subsequently expanded their services and facilities to host collaborative programs of learning support, renaming them LC. For example, Jana Futch Martin (2008), a university librarian in reference and instruction, posted a message on the INFOCOMMONS-L listserv that describes how the University of South Florida (Tampa) came to change the name of its Information Commons to Learning Commons: “We changed our name to Learning Commons after adding services adjacent to ours, such as the Writing Center and Tutoring and Learning Services. This collaboration—to have disparate student learning services from all over campus share one common area here in the Library—has been a great success so far.” This adoption of IC and LC working definitions was also evident in a presentation by Schafer (2008) for

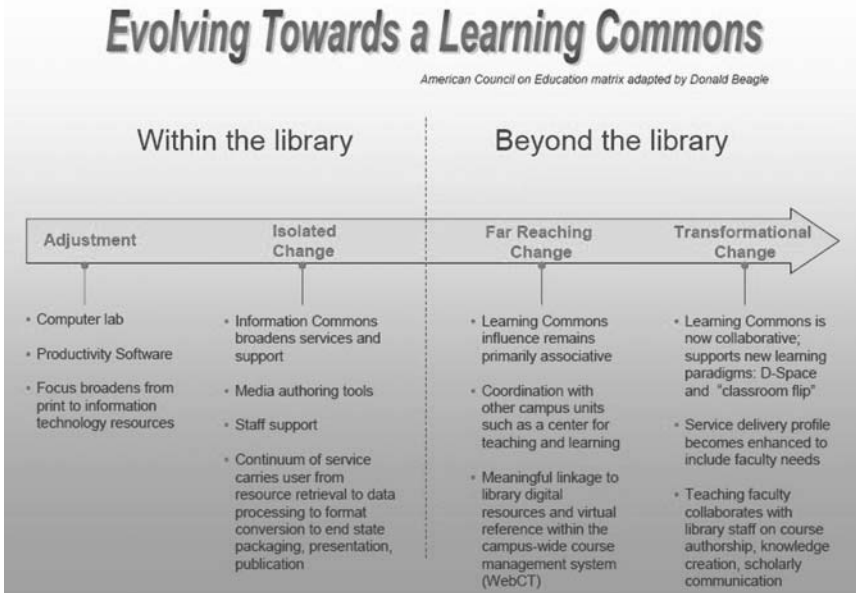


FIGURE 3 Evolving Toward a Learning Commons (A. Cowgill & L. Wess, 2006).

a Library Administration and Management Association panel at the American Library Association 2008 Summer Conference. Schafer's description of the development of the Du Bois Library Learning Commons at UMass was later summarized in a professional development blog at another university library: "They debated whether to call the new space a learning commons or information commons. They decided on Learning Commons, which to them meant integration of learning services, from the library or other campus units with ties to student success, retention, and inclusion of diverse populations" (Sutton, 2008). This blog entry is a good example of how semiformal conversations across the professional community have run on a parallel track to the formal discussion in the literature, reaching roughly equivalent conclusions. It is important to note, however, that the nomenclature of information and learning commons in both the brief and the *Handbook* were intended to be used as descriptive, not prescriptive, elements. And, accordingly, the local naming of IC and LC facilities continues to vary.

The related IC and LC definitions from the *Handbook* were quoted and amplified in an important recent editorial article by Bennett (2008, p. 843), who goes on to state: "The learning commons, so defined, depends for its success not only on joint action by support/service units (such as the library and academic computing) but also on the involvement of academic units that establish learning goals for the institution. Properly understood, librarians and academic computing staff cannot alone create a learning commons, as they serve but do not define institutional mission. Other academic units

do that and must join librarians and technologists in creating a learning commons. The fundamental difference between the information and the learning commons is that the former supports institutional mission while the latter enacts it. . . . [I]f we work with academic units and officers across the campus to design the commons primarily with the intention that learning will happen there, we are much more likely to see that magical moment when students, building on work begun in the classroom, take responsibility for and control over their own learning.” The “magical moment” mentioned by Bennett recalls the sense of astonishment expressed by Ross at the outset, and again reflects the properties of emergent phenomena. Although library administrators may not be able to predict final learning outcomes to a precise degree, it should still be possible to *anticipate* the unpredictable, to cultivate socio-cultural and technical connectivity by way of the commons, and to do so in ways that help set the stage for the ongoing emergence of new learning paradigms.

WEB 2.0, INTEGRATIVE LEARNING, AND THE COMMONS

It is, by now, a cliché to observe that many freshmen come to campus with technology skills exceeding those of some faculty, and that they bring with them a range of experiences with social utilities and personal media tools as both producers and consumers. In a culture in which presidential candidates are twittering from the campaign trail, astronauts are blogging from spacecraft, and soldiers are texting from warfronts, we have entered a time when many young people are saving and sharing a variety of informal learning experiences with social media tools. To the extent that such sites remain supported by advertising or other means beyond membership fees, they are already collectively forming an important subdomain of the virtual and cultural commons. Students are learning not only the experiential content of what they post, but also implicit and explicit social conventions and the necessary technical conversion and media translation skills. The freshmen who arrive on campus amid a virtual penumbra of posted experiences, digital surrogates, and second selves are exerting a collective directional pull that is necessarily drawing our colleges, our libraries, and our commons into new learning environments with them. It is a novel situation highlighted by Lisa Shen (2009), in her presentation on student reactions to the Information Commons at McGill University. Shen introduces her slides with a variant on the three-domain diagram from the *Handbook*, expressing her view of how this aspect of the cultural commons experientially stretches the physical and virtual commons from a posture of adjustment toward a transformative outcome (Figure 4). And she comments: “academic libraries have recognized and addressed the need for physical commons facilities and are usually in the process of establishing a virtual commons presence

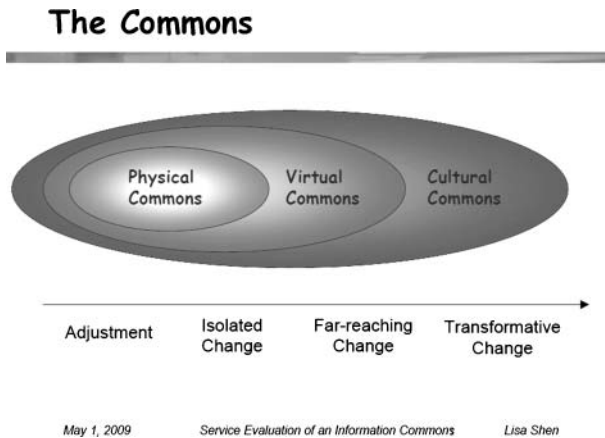


FIGURE 4 Service Evaluation of an Information Commons (L. Shen, 2009).

through multimedia and social networking initiatives. However, these efforts are sometimes seen as mutually exclusive projects, and thus fall short of transforming the culture of the library . . . another part of my emphasis . . . was to counter the tendency for libraries to rebrand newly built or renovated computer facilities as Information Commons, and stop there” (L. Shen, personal communication, June 1, 2009). Similar expressions of linkages between the commons and Web 2.0 applications have been discussed in an article by Sinclair (2007), and in a report by Secker (2007) of the London School of Economics.

Alongside the development of social utilities must be placed another factor: fewer students than ever before follow the stereotypical path of four years of college, followed either by a lifetime of work or by more years of graduate school and then a lifetime of work. As Batson (2009) notes: “Learning transactions are migrating from the classroom into the world . . . students are increasingly designing a learning path (often the rationale for a particular path appears only retroactively) that includes a gap year between high school and college, includes two or more institutions toward the first degree, a semester abroad, internships and apprenticeships, field experience, service learning, part-time work or even time off for full-time work, and other forms of experiential learning. At one time, we had a clear distinction between formal learning and informal learning during the four undergraduate years, with informal learning being perhaps 80 percent of what a young person needed to know in life. That easy distinction has slipped away.” Batson proposes the e-portfolio as the optimal tool for such “swirling” students to assemble their varied experiential and academic artifacts into an evidence-based digital tapestry of learning objects. But he laments the apparent absence of a single e-portfolio tool with the full range of necessary utilities to carry out the conversions, translations, consolidations, and

interpretations. Given this lack, he suggests that students will need upgraded semantic search and conversion utilities, ontologies, Web analytics, and more. True, but perhaps the lack of a comprehensive eportfolio application accentuates the value of a single physical and virtual “anchor resource,” a LC to serve as the central hub of those digital resources for students to return to and from which to draw repeatedly. The IC and LC seem well-positioned for this role in part because of their persistence: classes convene and adjourn, students depart and return, but the library commons remains open to students and alumni to harbor the IT platforms, media tools, and staff expertise to help them compile and consolidate the artifacts they gather as they navigate the varied knowledge-building experiences that constitute lifelong learning. This is the approach being planned at Belmont Abbey College, where the LC will host Taskstream e-portfolios that will cumulatively document student exposure to LC-sponsored information literacy sessions during First Year Seminar, research-intensive experiences tailored to English 101–102, and on through discipline-specific pilot and capstone courses with assessment rubrics designed around the ACRL information literacy standards. The implications for integrative learning are already being explored in the IC at Champlain College, as Janet Cottrell (personal communication, June 16, 2009) writes, “because our IC incorporates a faculty development center (instructional design etc.) we are much more involved with curriculum development than we might otherwise be . . . we are mining e-portfolio data for evidence of student outcomes in our integrated information literacy program. We felt it would provide more meaningful evidence than any stand-alone assessment.”

Integrative learning posits the need to “reform undergraduate majors so they would provide students with sustained opportunities to explore links across disciplines and with the world beyond the academy” (Huber & Hutchins, 2004, p. iv). The full scope of the integrative learning movement is too vast to be dealt with here, but it is a good example of a 21st century learning paradigm that has already begun intersecting the process of IC and LC development. The connection became apparent to this author in the course of a consulting project in LC planning with Salve Regina University (SRU) in Newport, Rhode Island. SRU had been 1 of 10 institutions selected to participate in the Integrative Learning Project, cosponsored by the Carnegie Foundation for the Advancement of Teaching and the Association of American Colleges & Universities (Huber, 2007). SRU’s approach has revolved around an integrative e-portfolio that follows the student from first year experience to the senior core capstone course, while along the way incorporating the student’s path through the full core curriculum, study abroad, community service, internships, apprenticeships, summer employment, the Honors program, and more. The conceptual language, philosophy, and learning support priorities behind IC and LC development have dovetailed effectively with the rationale of the Carnegie-funded project, and

the positioning of the LC as a mechanism to build on the progress made with integrative e-portfolios has played a significant role in successful grant proposals to reconfigure the main floor of SRU's McKillop Library into a Learning Commons (Salve Regina, 2009).

CONCLUSION

This article began at the Weigle IC in a large university in the east. It ends with the Harrington LC at a midsized university in the west. Santa Clara University, which its Web site describes as “the Jesuit University of Silicon Valley,” established a LC in 2008 that includes instructional incubator spaces for experimentation with new learning technologies. Already, since its March 2008 opening, LC staff have worked with a political science professor to help design, plan and coordinate a conflict resolution simulation; a professor in the management department has assigned students to use the lab's production capabilities to create videos on leadership and project management; and students in an English class have worked in the multimedia lab to create “machinimas” in Second Life as part of the analysis and reflection of Cory Doctorow's *Little Brother* (R. Boyd, personal communication, May 6, 2009). Second Life “machinimas” are an excellent example of how the transition from the age of print to the digital age has been, in certain respects, a transition from linear to nonlinear growth. Numerous examples of predictable linear growth could be found in traditional libraries; each year a typical library grew by X number of added volumes occupying Y linear feet of shelving. The IC and LC phenomenon has emerged on the cusp of a new pattern of growth as library administrators wrestle with new dimensions of complexity. The challenge of managing a learning organization during such a transitional time is summarized by Holbech (2005, p. 59–60):

An underlying assumption of emerging change is that human systems are so complex that no individual or small group of individuals can understand them fully enough. Organizations are seen as networks of multiple feedback loops, and change is the activation of a system's inherent potential for transformation. . . . 1) managers should pay as much attention to their environments and the . . . opportunities they contain as they do to their own plans; 2) Managers should raise their awareness of how they interpret events in the environment—particularly the assumptions and categories they use—as a key feature of both their own and organizational learning; 3) Managers should pay attention to creating fluid, adaptive organizations (e.g., in terms of structures, skills, processes, and information flows) so that the best strategies can emerge.

Clearly, the digital age is only in its infancy, and the pace and patterning of change will continue to challenge all aspects of library administration, not to mention our fiscal resources. As this is being written, the budgetary impacts of the financial crisis of late 2008 are beginning to hit home. We cannot fully predict the long-range consequences, but we can anticipate that pressures for efficient internal collaboration and colocation will increase. To the extent that IC and LC continue to be effective conduits through which fluid, adaptive organizational learning processes can flow, it seems reasonable to anticipate that they will be vital components of the libraries of the future.

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