

The Evolution of a Hybrid Collaboratory

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### Abstract

Research on collaboratories, or laboratories linked by information and communication technology (ICT) has emphasized identification of success factors and classification by main functions. This is a case study of The Laboratory of Comparative Human Cognition (LCHC) at UC San Diego, an example of a long-lived hybrid collaboratory. It combines functions of two of the seven collaboratory subtypes (Distributed Research Center & Virtual Community of Practice) identified in the Science of Collaboratories literature. This case study is informed by excerpts from LCHC publications and project reports, website & archival materials. I argue LCHC's hybrid form, and its members' use of ICT and other communication practices support inclusive and flexible membership practices crucial in LCHC's development and longevity as an organization.

*Keywords:* collaboration, ICT, virtual community, sustainability.

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### The Evolution of a Hybrid Collaboratory

Collaboratories or ‘laboratories without walls’<sup>1</sup> employ information and computing technologies (ICT) to support and expand distributed work. A science of collaboratories (SOC) emerged in the last decade, focused on how the Internet enables scientific research once requiring co-location of researchers to be carried out regardless of physical location.<sup>2</sup>

Vaast’s (2004) study of the emergence of “networks of practice” among users of Intranets analyzed the “dislocation of the situated” as a communicative phenomenon, as members began to “refer to a wider structure than their usual materially bounded work environment” (p. 39). This paper offers a case study of what I will describe as a long-lived social science collaboratory, the Laboratory of Comparative Human Cognition (LCHC). I am interested in how LCHC members’ reflections on the role of technology in the emergence of one such ‘wider structure’ both mark and are intertwined with key moments of growth and change at LCHC.

Would-be collaborators in many organizations now find many compelling reasons to engage with others around various objects of joint work in virtual spaces. As Putnam (2012) noted, this will likely be reflected in the proliferation of both interdisciplinary and international research. It makes sense for organizational communication researchers interested in interdisciplinary and international work to continue to engage with the science of collaboratories as we deepen our understanding of the communication processes underlying effective collaboration.

### Method

LCHC is broadly concerned with learning and development, within, as outlined on its website, “populations varying in age, culture, biological characteristics, social class, schooling, ethnicity, studied in a wide range of activity settings in various social institutions (schools,

hospitals, workplaces) and countries.” (<http://lchc.ucsd.edu/>). In what follows, I expand upon this brief description of LCHC and engage with pertinent insights from the science of collaboratories (SOC) and broader themes in collaboration research. I focus on key moments in the development of LCHC over three decades that point to some reasons it evolved as a hybrid collaboratory type. The data in the case study are excerpts from LCHC publications, project reports, conference presentations, website and archival materials accessible on the LCHC website. I view this data through the lens of my own experiences as an LCHC member and offer an analysis of key moments in the evolution of LCHC’s goals, projects and inclusive definition of membership.

### **About LCHC**

Over the course of three decades, LCHC, located for a brief time in the 1970’s at Rockefeller University in New York, and subsequently at UC San Diego in La Jolla, California, has drawn dozens of members whose disciplinary, ethnic, linguistic, social class, gender, generational, cultural and national-origin diversity have broadened the range of the lab’s intellectual concerns and impact. LCHC’s broad umbrella fostered a network of research partnerships and projects associated with designing, implementing, adapting and evaluating learning environments over several decades. Many members of LCHC share a commitment to longitudinal and multi-method research on processes of human communication used by adults and children, and learning and development in social and cultural contexts.

LCHC is also a hub for the Vygotskian-inspired perspectives of Cultural Historical Activity Theory (CHAT) and it is allied with research organizations and institutes in Europe such as the Center for Activity Theory and Developmental Work Research in Finland. LCHC is known in education research circles for some of its members’ work on designing, implementing and evaluating adaptations of the “Fifth Dimension” afterschool computer clubs. Adaptations of

this model, linking undergraduate and graduate students and researchers in support of literacy projects with at-risk children spread throughout the 1990's to inspire other projects in the U.S. and in several other countries. (Cole et al, 2006).

LCHC's founding members were early writers and adopters of computer games used in research on learning environments, and early adopters of email to link non-located researchers within and outside the U.S. (Levin, Riel, Rowe, & Boruta, 1985; Riel, 1985; Cole, Griffin & LCHC, 1987; Newman, Griffin, & Cole, 1989). Some of these LCHC affiliated scholars were also pioneers in the development of culturally competent methods for studies of cognition. (Moll,1990). LCHC projects have included work on the processes of learning and change within diverse populations and age groups at individual, interpersonal and organizational/systems levels of analysis (Cole, et al, 2006). Scholars connected with LCHC also contributed to an interdisciplinary and international volume on "collective remembering", studies which emphasized the social dimensions of what are usually treated as individual-level processes of memory and forgetting. (Middleton & Edwards, 1990).

Upon encountering the collaboratories literature, I realized that while Science of Collaboraories (SOC) researchers had not included this particular social sciences lab among their focal cases, LCHC fits the definition of a collaboratory. LCHC exhibits features of two of the seven collaboratory types recently identified in the SOC. (Olsen et al, 2008). Excerpts of periodic textual accounts and reflections by members of LCHC on the status of their work offer snapshots of LCHC evolving in order to sustain itself as a hybrid type of collaboratory. SOC researchers noted that collaboratories may serve multiple functions, but they classify the initial two hundred cases they analyzed in their 2008 volume by a "dominant" function (Olsen et al, 2008), and did not pursue the potential impact of serving "multiple functions". This new case

may help us appreciate the interaction between elements assigned to individual analytic categories within a typology. In this effort, I explore connections between an organization's multiple functions, noteworthy member inclusion practices and sustainability.

### **Literature Review**

Collaboratories or 'laboratories without walls' (Bos et al, 2007; Olson et al, 2008; Wulf, 1993<sup>1</sup>) employ internet technologies to support and expand distributed work. Initial definitions of "collaboratories" emphasized a vision centered on communication technologies, technological infrastructure, and their potential for work efficiencies. For example, Wulf's (1993) paper "*The collaboratory opportunity*", envisioned a 'networked system of computers...' locating 'the essence of the collaboratory, not in the physical infrastructure, but in the enabling software.' (Wulf, 1993, p. 854).

### **Communication and the Science of Collaboratories**

Bowker and Star (2001) drew attention to social issues in collaboratory design, pointing up inherently competing goals, such as desire for proximity/intimacy vs. building out a network and expanding the reach of community. (Bowker & Star, 2001, p. 34). Importantly, this kind of attention to 'competing goals' shifted attention toward a consideration of relationships *between* success factors or goals in various contexts, opening space for looking at relationships between multiple goals of collaborators and various collaboratory types.

In 2007, *The Journal of Computer Mediated Communication* published several articles on collaboratories of various types in one issue, with analyses using a variety of timescales, methodological approaches and paths to future research. It was clear that a "science of collaboratories" had evolved well beyond celebrating new hardware and software, with an

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emphasis on identifying and refining categories for a next phase in the science. This phase was devoted to identifying taxonomic views of success factors, functions, and organizational challenges, and expanding the variety of types of collaboratories studied. This issue of JCMC captured an expansion of interest in collaboratories among scholars of communication, and linked the SOC to concerns of larger communities interested in problems and challenges of organizing and sustaining collaborative work.

**Taxonomies in the science of collaboratories: Types, success factors and tensions.**

Subsequent to the JCMC issue, a 2008 book, *Scientific Collaboration on the Internet* explored the productivity of collaboratories. Included among ‘kinds of outcomes that would count as success’, are ‘effects on science, science careers, learning and science education, inspiration to others, funding and public perception, and tool use.’ (Olson, J., Holfer, E., Bos, N., Zimmerman, A., Olson, G. Cooney, D. & Faniel, I, 2008, p. 75, table 4.1). An acknowledgement of tensions between specific attributes of collaboratories and the achievement of collaboratory goals is included in this study. One persistent tension is the size of the collaborative effort vs. coordination (the larger the effort, the harder it is to coordinate). Coordination problems are shown to negatively impact “accumulation” (of knowledge, results). The second tension noted by Olson et al is the challenge faced by diverse groups in “building common ground and trust, with common ground and trust shown to be positively related to productivity and new ideas”. (Olson et al, p. 89). A next useful step may be to look more closely at connections between forms, functions, membership and collaboratory longevity.

**Communication and collaboration research.**

As we have seen, by 2008, the initial techno-centrism inherent in Wulf’s definition of a collaboratory had faded. SOC researchers reported findings and insights that would not surprise

researchers of the interpersonal dynamics of creative partnerships (John-Steiner, 2000) or researchers in other fields who have identified success factors characterizing collaborations amongst members of two or more institutions pursuing common goals (Czjakowski, 2007; Mattesich, Murray-Close & Monsey, 2001). Collaboratories face the sustainability problems and difficulties achieving goals that all collaborative partnerships managing distance in various ways encounter. (Cummings & Kiesler, 2008).

More recently, Putnam, (2012) Heath and Isbell, (2015) and Koschmann (2013) have highlighted several aspects of communication and collaboration germane to the science of collaboratories generally, and to this new case study of LCHC. For Putnam, writing a farewell address for *Management Communication Quarterly*, looking back and forward on the field, and commenting specifically on the journal *Management Communication Quarterly*, (2012), interdisciplinarity “refers to the breadth and depth of dialogue among an array of scholars who share common threads and yet respond to different disciplinary pulls.” (p. 514). Heath and Isbell (2015) invite communication scholars to develop a pedagogy of collaborative ethics, structures and skills. This call is timely for those embracing that development and working to manage those “pulls”.

Other scholars of collaboration hope to help students become well prepared to confront complex problems that require the resources and talents of multidisciplinary teams in many geographic locations. As Koschmann (2013) notes,

“collective identity may at times appear to be stable, but this stability is a function of sustained interaction patterns, not an inherent property of the organization that exists outside its current membership and organizing practices.” (p. 83).



We need more accounts of how collaborative enterprises develop and survive, including examples of scholarly communities that have been simultaneously interdisciplinary and international, and wherein collaborative behavior is valued and effective. In the next section, I extend Koschmann's observation to some of the sustained interaction patterns around LCHC and explore how these reflect its evolution as a multiple-function, hybrid collaboratory. We will see how various forms of association and affiliation with LCHC serve several purposes for its members, and offer different ways to be a member across time. This case offers a new look across aspects of collaboration that researchers have assigned to individual analytic categories (technology use, collaboratory function, membership practices) to attend to how these shape each other.

### **Evolving Multiple Functions**

LCHC is a hybrid of two functional types of collaboratory introduced in the SOC research: Virtual Community of Practice and Distributed Research Center. Bos et al (2008) define the 'Virtual Community of Practice' collaboratory type as 'a network of individuals who share a research area and communicate about it online' (Bos et al., 2008 pp. 62-63). The 'Distributed Research Center', by contrast, 'functions like a university research center but at a distance. It is an attempt to aggregate scientific talent, effort, and resources beyond the level of individual researchers. These centers are united by a topic area of interest and joint projects in that area. Most of the communication is human-to-human.' (Bos et al, 2008, pp. 64-65).

Classifying LCHC by a main function (as in a typology approach) or by the goals of any one of its research projects cannot capture the work of several decades. LCHC evolved to serve different functions for its members as organizational challenges presented themselves, performing and emphasizing different functions through multiple communication channels and

types of activity at different moments over its life course. LCHC members have incorporated reflections on their own communicative practices in their scholarship, writing about various uses of technology and attendant challenges of using communication media. There is a history of periodic reflective commentaries about the state of LCHC itself since its origins (Gack and Finkelstein, 1992; Ekeblad, 1999). In the next section, I use excerpts of editorials from lab publications from 1976 and 1994, a report to a funding agency in 1984, and an example of a collaborative authoring project in 2010 to illustrate the evolution of hybridity as a strategy for sustaining the organization.

### Data

Below is one such commentary, an excerpt from the editorial statement from the inaugural issue of the *ICHD Newsletter*, in 1976, volume 1 number 1, spring 1976:

#### Data Excerpt 1: 1976 Newsletter

The “we” referred to here are the members of the LCHC and its training counterpart, the Institute for Comparative Human Development. The Newsletter is designed to fulfill one of the Institute’s principal functions—to act as an information center for scholars interested in problems of population differences in cognitive performance...<sup>3</sup>

This text excerpt is taken from an “old-media” tool supporting the practice of member inclusion: a periodical, text-based paper newsletter to distribute information, communicate with others not physically present as students or researchers at the “information center.” In the pre-internet era, the ICHD newsletter, (later, the *Quarterly Newsletter of LCHC*) regularly included commentaries, think pieces and works in progress, and kept those who followed the work of the

nascent lab apprised of colleagues' work in between face-to-face meetings.

By 1984, the lab had moved from its original location at Rockefeller University and had been at UCSD for 6 years. The lab's "information center" and "training" functions described in the 1976 text were continued, in "a cultural psychology laboratory"; offering a working environment for (undergraduates and graduates) and visiting scholars undertaking several research projects. Scholars from diverse backgrounds and perspectives came together around numerous projects. They worked in various configurations to develop the theoretical and methodological expertise needed to do the collaborative, culturally competent, multi-lingual, longitudinal and multi-site literacy research crucial to the lab's mission.

#### **Data Excerpt 2: Annual Report to Carnegie**

In an annual report in 1984<sup>4</sup> to a funding agency, the Director of the LCHC, Dr. Michael Cole outlined many challenges to the sustainability of the laboratory. An important challenge was the local impact of the lack of diversity in academe. This was exacerbated by the traditional individualism and hierarchical structures of research universities that made it difficult to sustain the basic requirements for the new kind of research on literacy and development in community settings envisioned by scholars and students attracted to the work of LCHC. Cole wrote:

More or less the same pattern of institutional restriction has repeated itself in our current circumstances. The creation of an interracial, interdisciplinary social science research group to study the social organization of inequality is no more a priority for UCSD than for Rockefeller. Despite several years of effort, no tenure track minority group scholar has joined LCHC since our arrival in California, nor are there any prospects for a change in this situation.

However, Cole noted, there was a way forward:

Consequently, the goal for LCHC in the coming years will be to continue as a research center within which to work out practical models of educational transformation using the principles of cultural psychology and to serve as an information center coordinating researchers with an interest in comparative cognitive research.” (Cole, M. (1984). *A program of research and training in cultural psychology. Report to Carnegie*, p. 47)

By the late 1980’s LCHC was becoming more than an “information center” collaboratory type. It was associated with its physical location at UCSD, yet not reducible to this physical location. It contained elements of a “virtual community of practice” and was becoming well known as a “distributed research center.” Scholars from around the U.S. and other countries visited the lab, and UCSD based scholars visited colleagues abroad. Funded projects to study new ways to use computers and email in conduct multi-site comparative international research allowed former LCHC members who did not have permanent research and teaching positions at UCSD to remain engaged in the LCHC community of scholars, just as some members had once remained engaged in prior years via the ICHD and QLCHC newsletter. The lab’s electronic mail list serves allowed new members to discover LCHC’s work in advance of, after (or instead of) visiting or becoming a collocated researcher.

In the late 1980’s LCHC members responded to the challenges of recruiting and retaining diverse scholars in the “physical” home of LCHC by using email and to organize and then communicate about work on various funded projects. Some of these projects were focused on international exchanges and joint research with scholars who shared interests in Vygotskian theory and cross-cultural studies of child development. This distributed approach to organizing

work also informed later projects on creating, scaling up, disseminating and evaluating model after school activity programs. Well into the 1990's, such projects linked members of LCHC in research and teaching positions in different academic disciplines at several institutions in the U.S. and abroad as co-Principal Investigators, implementing and evaluating adaptations of the 'Fifth Dimension' model with a diverse range of child and adult participants in multiple field sites.<sup>5</sup>

SOC Researchers articulate concerns about coordination, misunderstanding, status, power, sharing, competing goals and other factors posing challenges to collaboration.<sup>6</sup> LCHC members actively managed such organizational challenges by not having a single, narrow research focus or interest that lasted only the length of one grant cycle. The wide variety of scholars and disciplines represented in LCHC membership broadened the lab's intellectual concerns beyond any one discipline or type of institution, conferring as an advantage over time, a way to foster community among scholars with research interests not shared by disciplinary (or institutional) peers, and ensuring regular access to information about the work of colleagues around the world.<sup>7</sup> The 1984 Carnegie report identified cooperative practices across institutions, the newsletter, listserves, expanded international cooperation and continued "information center" status as intertwined means to promote the sustainability of the LCHC.

LCHC-linked scholars began share an enduring sense of the lab as an important intellectual resource or sort of home, regardless of how long (if ever) they were actually collocated in the lab's physical space. Students, visiting scholars, researchers, and others could engage with LCHC's ideas and projects via newsletter, visit or list serves.

### **The Hybrid Form Emerges**

The “Distributed Literacy Consortium/Fifth Dimension ” project era of LCHC reflected the combination of SOC collaboratory types “Distributed Research Center” and “Virtual Community of Practice.” This hybrid structure allowed the lab to capitalize on its tradition of membership diversity. As LCHC became the home of one node of a “Distributed Literacy Consortium”, the non-collocation of members and diverse expertise offered the advantage of a deep bench of scholars with prior experience or knowledge of the history of the lab, along with ready access to archives of material and publications for those new to the community.

Because its members could avail themselves of shared experiences of research collaborators predating the Internet, and those already accustomed to distributed work arrangements, LCHC could marshal the types of expertise and trust among partners required to work as a consortium linked via the Internet. Throughout that decade, LCHC researchers formed teams to work on different aspects of large-scale multi-year projects. Some members implemented activities at field sites, others served as members of evaluation teams focused on analyzing different kinds of data, and still other members of the lab engaged in projects funded by different grants altogether.<sup>8</sup>

An instance of this expanded scope of intellectual concerns as a strategy for lab sustainability can be seen in the emergence of yet another strand of research that became important at LCHC. Developmental Work Researchers came to LCHC, reinvigorating connections between researchers in several countries and LCHC.<sup>9</sup> For a brief period time (the late 1980’s into the mid 1990s), scholars came to the lab to advance theoretical, methodological and philosophical work on cultural historical activity theory as a framework for studying changes in the organization of workplaces and educational settings. (Engeström, 1997, Engeström and

Middleton, 1998).

LCHC's reflexivity about diversity in its "technological practices", goals, and processes for supporting member communication and involvement made a range of research foci, as well as an expansion of membership possible. Technology use has been both a topic of research and a tool for LCHC research support.<sup>10</sup> Intentional approaches to accessibility, usability and inclusivity allowed for broad participation (intensive or intermittent) in what lab member Ekeblad described as an LCHC "multilogue",<sup>11</sup> by techno-savvy and low-tech users, newcomers and old-timers. Many lab members use email list serves (such as xmca or xlhc<sup>12</sup>) to supplement face-to-face meetings and project activities, allowing for the "aggregating of talent, effort and resources" that collaboratory researchers associate with a Distributed Research Center. Linking particular interests, skills and goals within its member network to funding opportunities, calls for papers and joint writing projects fostered an ability to include members at a distance and to reconnect with members when new opportunities arise, thus promoting a Virtual Community of Practice.

The printed newsletter publications *Institute for Comparative Human Development* (1976-1978), and its successor the *Quarterly Newsletter of the Lab of Comparative Human Cognition* (1978-1993) mentioned earlier, ultimately evolved in the mid 1990's into the peer reviewed journal *Mind, Culture and Activity*, the source of my next data example.

### **Data Excerpt 3: 1994 Mind Culture and Activity**

In the inaugural issue of one of the editors noted:

In the last several years, discussions in the Newsletter began to intersect

and overlap with discussions in the then-new medium of electronic mail. ...XLCHC discussions moved very rapidly, bringing together unusual, and often stimulating juxtapositions of ideas...<sup>13</sup>

The editors also noted later in this editorial comment:

Young scholars who had been raised to believe in the kinds of approaches that appeared in the Newsletter did not have a bona fide source in which to publish their substantial contributions. The fact that the publication was ‘only’ a Newsletter meant that articles could not be placed in the vita category called ‘refereed journal articles’. What had been a useful, semi-formal means of communication was becoming a liability for the next generation....”<sup>14</sup>

This editorial comment excerpt from the inaugural issue of *Mind Culture and Activity* provides part of the rationale for a shift from publishing a newsletter to a peer-reviewed journal, making explicit the reality of power relations in academe, such as publication requirements faced by junior scholars. The list serves would continue, to provide opportunities for less formal electronic conversation and exchange of ideas among all LCHC members. The editorial comment addresses members of various statuses and locations, (in the ‘virtual community of practice’) as well as those involved in specific projects (in the ‘distributed research center’). This commentary reflects a deliberate orientation toward using communication media of various kinds strategically and responsively to the needs of community members, to achieve several of the outcomes later associated with “success” by collaboratory researchers: “effects on science, science careers, learning and science education, inspiration to others, funding and public



perception, and tool use”<sup>15</sup>

### **“Membership” in Data Excerpts 1-3**

We have seen in these accounts snapshots of an expressed desire to publicly affirm an inclusive process and definition of ‘membership’ to support multiple goals. The commentaries point to LCHC senior members’ active cultivation of flexibility in the collaboratory’s ends and means. As noted earlier, SOC researchers have noted that collaboratories may serve multiple functions, though typically are classified by a “dominant” function. These texts reveal awareness among lab members of specific benefits to and challenges of serving multiple interests and functions over time. Definitions of membership itself in the LCHC community have been fluid, not arising exclusively from a specific status, amount of time spent physically at the lab, involvement in a single research project or particular interest area. LCHC has avoided specialization on problems that affect only one population, age group, or which are of interest to only one kind of funding entity, student, scholar or discipline, or which require use of a specific technology or platform. Thus, there is considerable diversity among scholars and students attracted to the work of LCHC—and in the degree of investment in and basis for self-identification as an LCHC “member”. Members may have different goals and interests, moving between the virtual community of practice and the distributed research center in their activities over time.

At present, with fewer collocated members and projects currently underway, the lab’s local infrastructure is smaller than it was in the 1980’s and 1990’s, and there are more members not collocated than collocated. However, as this final example about a recent collaborative authoring project shows, members continue to connect with other members via ICT’s to find

opportunities and ways to work together.

**Data Excerpt 4: The “Scribner Address”: Using Technology to Distribute Work and Include Members**

LCHC received the 2009 “Sylvia Scribner Award” from Division C (Learning and Instruction), and delivered an address at the meeting of the American Educational Research Association (AERA) in April 2010 in Denver. As the description notes, “The award recognizes a program of work... that has significantly influenced thinking and research in the field of learning and instruction.”<sup>16</sup>

LCHC’s “Scribner Address” was notable for its joint authorship, delivery and audience participation. Notably, no one in the audience seemed fazed by the deviation from the standard “solo award speech” academics typically expect at such occasions. A tradition of joint authorship and shared credit in many LCHC publications expresses what Mattesich et al (2001) identify as a key collaborative membership principle, a “shared stake in the process and outcome of the work”.<sup>17</sup>

Michael Cole, the lab’s founder and director, is listed on the AERA website as the award recipient. He could have authored and delivered the speech, but he made it clear to the award-conferring entity which sought to honor him that “LCHC” should be the recipient and author. Thus, half a dozen LCHC members representing several periods in the lab’s history, and now located at several institutions in different academic departments around the country jointly authored and delivered the address<sup>18</sup>, meeting face to face and working over email from several geographic locales to produce it. Time was set aside for LCHC “alumni “in the audience to come

to the microphone and add their voices to the address. Former and present graduate students, post-docs, visiting researchers and mid-career faculty from universities and other organizations across the U.S. were in attendance. Senior scholars nearing retirement and current graduate students nearing dissertation completion shared the stage. Several LCHC scholars involved in authoring and delivering the address (including the author of this article) are currently writing a ‘polyphonic autobiography’ of LCHC and its contribution to the social sciences, an effort that began alongside and continued after the address. The texts are being coauthored on wiki.

The Scribner address brings to mind Koschman and Mc Donald’s (2015) discussion of the link between ritual and “authoritative text”. Those authors observe: “Rituals are powerful precisely because they cannot be reduced to the actions of individuals, but make present the full force of the organization—its values, norms, and relations of power (i.e., its authoritative text).” (p. 247).

This moment from 2010 resulted from years of experience and shared understandings. In it we can see the role of a prior history of the lab as a place that fostered and valued effective collaboration. This prior history enabled members’ processes of creating, delivering, attending and making sense of this address. It shaped speakers’ and audience members’ acceptance of and enactment of a deviation from the standard protocol of award speeches. The address as composed and performed as a ritual offered an account of the lab as an enduring intergenerational community.

### **Discussion and Implications**

These excerpts of editorial commentaries in publications and reports to funders and lab

members and other audiences on the state of LCHC by senior members in 1976, 1984, 1994, and 2010 provide snapshots of an expressed desire to publicly affirm an inclusive process and definition of ‘membership’ to support multiple goals. The text commentaries and the Scribner address can be linked to demonstrate LCHC members’ longstanding active cultivation of what we can now recognize as a hybrid collaboratory form.

The two texts from the newsletter and journal editorials, the funding report, and the processes of composition and delivery of the Scribner address reveal awareness among lab members at various times of benefits and challenges facing an organization serving multiple interests and functions. One clear limitation to the analysis presented here is of course that the excerpts and samples discussed offer a selective and limited view of the work of members of the lab over a 30 year period. The analysis emphasized the perspective of senior lab members, and the excerpts were selected because they spoke mainly to moments of change and challenge.

Not all collaboratories are intended to endure indefinitely. Indeed, it makes sense for a collaboratory with a well-defined purpose and goal to disband when its goals are attained and projects completed, or when their founders retire.<sup>19</sup> At present, with fewer collocated members and projects currently underway, the lab’s local infrastructure is smaller than it was in the 1980’s and 1990’s, and more members are not collocated than collocated. Decades ago, as a response to barriers to member collocation, LCHC became bigger than its physical footprint. A glance at the LCHC webpage finds alumni, visitors, and research affiliates across the U.S. and around the world.<sup>20</sup> LCHC’s virtual community of practice and distributed research center functions have thus far continued to feed each other, offering flexibility in involvement that has sustained it over time as an intellectual community across space and time for over three decades

and to the present. As this case shows, a multifunction or hybrid strategy explicitly geared toward addressing many members' needs, goals and scholarly interests may strongly position collaboratories whose members are interested in sustainability to pursue a similar strategy of hybridity to manage change and growth.

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## ENDNOTES

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- <sup>19</sup> LCHC founder Michael Cole retired from UC San Diego in 2013.
- <sup>20</sup> Retrieved August 12, 2015. personal communication. from Mike Cole to xlchc@ucsd.edu mailing list. "For the period beginning on 12/1/2014 and ending on 8/11/2015 therewere a total of 5,431,964 page views at <http://lchc.ucsd.edu>, of which 3,454,745 views were of pages in the XMCA mail archive. During the same period, there were 484,247 total page views at <http://xmca.ucsd.edu> webpage."