Editor’s Message

It is entirely appropriate that this month’s column represents a collaboration. Karen Lunsford and I are working together to study how people—scientists, writers, teachers, students—come together to share their expertise, to construct something more than they might have alone, and to learn from one another in the process. As we collaborate, we learn about the process, just as we learn by seeing how others do it.

In their collaborations, people increasingly make use of new information and communication technologies to augment their work. Technologies have always been used to support collaboration: At one time these may have been marks on a log or jottings on paper. More recently, we have seen telephones and e-mail as communication tools for collaboration, along with databases as information tools. Notes taped to the refrigerator door must be one of the most powerful of these collaborative technologies, if one can infer anything from the way such notes are relied on in so many homes and offices.

Today, even more powerful collaboration tools are being developed and explored. These are coming together into suites of tools that help create virtual workspaces. We take here a brief excursion into some of these spaces with the aim of understanding how they may be changing the way people communicate, make meaning, and work together.
Defining a Virtual Workspace—The Call to Collaborate

Within the past decade, attention has been increasingly paid to collaboration in business, research and development, and education. This interest has been driven to a great extent by economics: How might people work together more efficiently to accomplish what no single person could do? In light of a new information-based economy, how might organizations best capture the knowledge created tacitly by their members? How might nations better teach students to become more flexible employees who can move among projects and into new situations quickly? How might new technologies provide more effective ways to collaborate, especially ways to write collaboratively?

Long before these and similar issues surrounding collaboration caught the attention of the general public, they had become critical for scientists: Since World War II, basic research and development projects have proven more and more expensive to conduct. The image of the isolated Dr. Frankenstein in his laboratory, always something of a myth, has now become thoroughly displaced. Today’s scientific enterprises often must rely on huge, multinational consortiums. For example, hundreds of high-energy physicists must work together to find massive funding for the supercolliders they need to conduct their experiments (Knorr-Cetina, 1999). Seeking to understand better how such collaborative enterprises work and to promote further collaborations, the U.S. National Science Foundation has recently funded new projects to study and to implement interdisciplinary teams (Hackett, 2000).

More broadly, educational institutions at all levels have begun to focus on collaborative issues. As funds for universities, colleges, and schools have shifted from the public to the private sector, new partnerships between educational institutions and industry have grown. Recently, the Boyer Commission on Educating Undergraduates (1998) called on research universities, particularly humanities departments, to include undergraduates more regularly in meaningful research projects. Speaking to K–12 teachers, Murnane and Levy (1996) have argued that students ought to be taught the “new basic skills” of communication, collaboration, and learning to prepare them for successful careers in this new economy.

In response to these increased calls for collaboration, new technological tools have been developed to promote better communication and the better sharing of data. Several tools have become routine for many Internet users: bulletin boards;
e-mail, with and without attachments; databases, usually with powerful search engines; electronic calendars and schedulers; and PowerPoint slides that can be displayed on the Web. Not only have these tools become common in the workplace, but they are also becoming more available to more students as school districts attempt to close the digital divide.

Yet, even though tools such as these may promote collaboration, they should not be viewed as simple, isolated answers to collaborative issues. Instead, a growing literature suggests that we should view tools and people as constituting complex activity systems that must be better understood if we are to understand collaboration. Distributed and situated cognition theorists such as Cole and Engeström (1993), Hutchins (1995), and Wenger (1998) have examined how collective knowledge is generated through interactions among and between people and the tools they employ. Similarly, Knorr-Cetina (1999), a sociologist of science, has described the epistemic (knowledge-building) cultures that form around collaborative, scientific projects. Latour (1996, 1999) has likewise studied how scientists, technologists, and city planners generate tacit assumptions that deeply affect the success of an experimental project. Ethnographers of writing such as Cintron (1997), Flower, Long, and Higgins (2000), Prior (1998), and Spigelman (2000) have focused on the complex engagements between “authors,” “readers,” and “texts” as people read and write—and they have challenged any single, stable definition of these terms, for the roles are constantly renegotiated. A single collaborative tool is always part of an activity system, as when writers exchange drafts of texts through e-mail for feedback.

Individual tools, however, may also be deliberately gathered together to form collective, virtual workspaces. When the tools are thus incorporated into a website, the site can be a central, quite visible locus for some of a community’s activities. It provides a record of an activity system at the same time it supports that system. The site might also serve as a boundary object (Star & Griesemer, 1989; Wenger, 1998), or an artifact that can be shared among different communities and can act as an interface between those communities. The collective, virtual workspaces that most interest us here are called collaboratories, a coinage combining collaboration and laboratory.

What Counts as a Collaboratory?

There are many collective or potentially collective sites on the Web. For example, Web logs, or blogs, may range from individual diaries with regular readers to lists
of annotated, bibliographic entries provided by various blog team members. Amateur, electronic magazines called Webzines may be collectively written; more important, they are often central to a fan club’s activities. Yahoo! Groups, HotOffice, NBCi, and other commercially sponsored sites often provide a range of collaborative tools to support clubs or work groups. What distinguishes collaboratories from these collective sites?

The answer is complex. Defining the term collaboratory is rather like defining the term game, as Wittgenstein (1953–1958) described the problem. According to Wittgenstein, no single, objective dictionary definition can account for every specific example of something that English speakers might call a game. First of all, in this case a vast range of things might count: children’s role-playing, sports, board games, bar stunts, puzzles, as well as things that have not yet been contemplated. But, beyond this there is the problem of the apparent exceptions to a single definition of game: What if most of the pieces are missing? What if people do not seem to be following rules? What about activities that might be called by some other name? Are these things still rightly called games? Wittgenstein responded that people do not keep precise dictionaries in their heads, but rather come to understand all words through their use. English speakers align with more or less agreement on the several attributes that might constitute a game, and negotiate, often tacitly, whether a particular activity with certain attributes is more or less game-like. Thus, an online site cannot be a collaboratory per se, but it may provide the means for enacting a collaboratory. The collective sites mentioned earlier may also support collaboratory activities.

The negotiations over collaboratory are perhaps more visible because the word’s use is expanding. Several dictionary definitions, as well as the person credited with coining the word, point to the term’s origins in science. William Wulf was working for the U.S. National Science Foundation when he originally described a collaboratory as a

center without walls, in which the nation’s researchers can perform their research without regard to geographical location—interacting with colleagues, accessing instrumentation, sharing data and computational resource[s], and accessing information in digital libraries. (cited in Kouzes, Myers, & Wulf, 1996)

A collaboratory was a set of resources—仪器nts, data, computers—that scientists could share to save expenses and to work on problems together. But the word is also beginning to appear in educational websites such as The
Collaboratory Project (Northwestern University, Chicago) and in research about those sites (Dorneich, 1999; Robins, 2000). Although vestiges of its scientific origins may remain, the term is no longer confined to scientific circles. Among teachers, the basic concept is familiar to many because it is a way to extend cooperative learning.

The term *collaboratory* is also particularly negotiable because its parent words—*collaboration* and *laboratory*—are themselves seen as flexible. For example, Ede and Lunsford (1983) named at least three general categories of activities that may be counted as collaborative writing:

1. Intensive collaboration where two or more authors create one text by working closely together—often by talking through and writing the text together; 2. Collaboration that does not depend on intensive and ongoing personal contacts but that may involve some work together but also considerable work completed separately; 3. Group collaboration that occurs via a sequence of activities, as in the writing of a business's annual report or of a state or federal regulation. (http://www.stanford.edu/group/collaborate/wisdom.htm)

Similarly, Knorr-Cetina (1999) shifted the definition of *laboratory* away from a simple definition of a space: “We need to conceive of laboratories as processes through which reconfigurations [of objects of investigation] are negotiated, implemented, superseded, and replaced” (pp. 44–45, italics added). Just as *collaboration* and *laboratory* refer to activities that can be variously experienced and defined by participants, so does *collaboratory*.

Nevertheless, we would like to suggest some attributes that are found in a collaboratory, attributes that might be used to determine whether something is more or less collaboratory-like:

- **Shared inquiry.** Reflecting its origins in scientific communities, the term *collaboratory* suggests that participants share not just common goals (say, a social activity) but a common set of problems or issues—ones that interest them and that they are working together to study more deeply and perhaps to solve.

- **Intentionality.** Although people regularly work together under many circumstances, a collaboratory (as perhaps, collaboration) tends to be recognized by its participants as a joint venture; there is a shared consciousness of the site’s status as a mutual project. This awareness can cause it to become a generative space in which each participant...
appears to gain as much or more than he or she gives. Thus, there is a “tipping point” (Gladwell, 2000), which leads to the critical mass awareness needed before a collective site is perceived by its members as a collaboratory.

- **Active participation and contribution.** A collaboratory exists to the extent that its members use and, more important, add to its resources. Members also continually negotiate with one another over their projects. Often, a collaboratory will contain member profiles to enable further communication and to identify common interests.

- **Access to shared resources.** A collaboratory provides the unique information (data, links, research findings) and tools needed by its participants.

- **Technologies.** Collaboratories involve technologies, whether they are scientific instruments shared by far-flung communities, the unique symbol systems used among participants, or the information technologies needed to communicate. A collaboratory is usually Web based.

- **Boundary-crossings.** Collaboratories bridge gaps and distances of (a) geography, by providing international access through the Internet; (b) time, by supplying both synchronous and asynchronous communication technologies; (c) institutions, by allowing groups access to tools and materials of common interest; and (d) disciplines, by enabling the participants to decide what resources are most relevant to a topic, without regard to traditional understandings of what constitutes a particular discipline.

Because collaboratories record and enable a community’s activities, they are a potential boon to instructors, particularly science and writing instructors. On the one hand, a collaboratory often reflects the history of a community (e.g., the shared resources, completed projects, older documents). As a result, collaboratories demonstrate how people pursue and complete certain inquiries, as well as how they develop spin-off inquiries from the original plans. If the collaboratory contains many documents, it also models how different genres of writing—grant proposals, conference papers, lab reports, computer codes, presentations,
bibliographies, informal drafts—work together to support and literally compose a research project. Such models may improve on those in textbook scenarios because the collaboratory provides more context—the activity systems—that informs how the documents achieve their rhetorical goals (or do not).

On the other hand, some collaboratories may welcome student participants, thus allowing them to engage directly in a meaningful collaboration. Classes are always free to set up their own collaboratories based on what they may find on the Web. Such course collaboratories may extend beyond the semester’s end by enabling students to return to their work or by inviting new students and teachers to participate in them.

Website of the Month

The Space Physics and Aeronomy Research Collaboratory (SPARC) project (http://intel.si.umich.edu/sparc), according to the site, has brought together “an international community of space, computer, and behavioral scientists” to design the infrastructure needed on the Internet to support collaborative work on “space and upper atmospheric science.” In addition to conducting scientific experiments, this collaboratory supports Windows to the Universe (http://www.windows.ucar.edu). This educational site, funded by the U.S. National Aeronautics and Space Administration, invites teachers, students, and the general public to explore the instruments, computer models, real-time data, and theories that scientists use. SPARC’s section on Windows to the Universe offers outlines of classroom activities, opportunities to “Ask a Scientist” questions, rules for science-based games, images of the sun and earth, and a range of information about myths, fun facts, and ongoing SPARC experiments. Because it allows users to select an appropriate level of difficulty for content (beginning, intermediate, and advanced), it is a particularly enjoyable and accessible scientific site.

How You Can Participate

Collaborate! (http://stanford.edu/group/collaborate) is a new site designed by Corinne Arraez, Lisa Ede, and Andrea Lunsford to provide an alternative to the
"adversarial academy." The editors hope to change institutional practices in the
humanities that overlook collaborative research, writing, and teaching. To this
end, the site provides models of collaboration, as well as resources to inform
further research on collaboration. The editors invite your comments and
contributions.

The Collaboratory Project (http://collaboratory.acns.nwu.edu/cwebdocs/
index.html) is an example of a regional attempt to build a collaborative virtual
environment to support education. Funded by Ameritech, this project is run by
Northwestern University’s Information Technology group. The project enables
schools, museums, libraries, and other cultural institutions in the greater Chicago
area to share information.

The Inquiry Page (http://inquiry.uiuc.edu) provides resources such as re-
ferences, contacts with other teachers, lesson plans, and presentational material
to support inquiry-based learning. The most important tool is the Inquiry Unit
Generator, a Web-based template that helps users outline an inquiry-based course
unit, including its lesson plans. The generator converts the information that
teachers enter into a webpage that may be restricted to a few users or shared
openly on the Web. Because the units contain keywords and standard fields,
they are searchable; so teachers may view units on specific topics that interest
them. The Inquiry Page is administered by a group of university professors, K–12
teachers, graduate students, and members of the National Center for
Supercomputing Applications, but it is currently open to all.

Barbara and David Mikkelson’s Urban Legends Reference Pages
(http://www.snopes.com/index.html) track unlikely stories that appear in the
media and on the Internet. The aim is to research the stories’ origins to deter-
mine which are true (not many, although some contain germs of truth). The
Reference Pages also debunk hoaxes, such as petitions against bills that have
never been proposed. Associated with the California San Fernando Valley’s
Folklore Society, the Reference Pages are supported by “hundreds of readers.”
These readers alert the editors to new folklore resources, correct any errors they
find in the reference pages, and report on the latest appearances of urban leg-
ends and hoaxes in such places as circulated e-mails, news reports, movies, or
songs.
Glossary

**Blog, Blogger:** the term *blog* is short for *Web log*, which was initially a chronological, sometimes annotated listing of the URLs that a Web designer had visited. Blogs have evolved into a variety of Web-based logs, from online diaries to collections of jokes and annotated bibliographies kept by individuals or teams. Blogger is one software site that allows users to create, manage, and post their blogs to their own sites or to a Blogger server.

**Cooperative learning:** an instructional approach in which students work in groups to solve problems, thus developing the interpersonal skills of communication, leadership, decision making, and conflict resolution. Cooperative learning creates a community of inquiry in the classroom similar to what the philosopher C.S. Peirce described as he observed the work of scientists (see Johnson & Johnson, 1998). The Cooperative Learning Center is at the University of Minnesota.

**E-zine, Webzine:** an electronic, amateur magazine. E-zines derive from fanzines, literally cut-and-paste, home-produced magazines often devoted to discussing popular shows and fiction (especially science fiction) and to distributing spin-off texts. Now, e-zines encompass a wide range of topics, as well as a variety of delivery systems. Webzines are e-zines found on the Web, whereas other e-zines are still delivered as ASCII files through e-mail.

**Yahoo! Groups:** one of several commercial sites that offer various bulletin boards, e-mail, calendars, document storage, and chat rooms to support a community’s online activities.

**REFERENCES**


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