Can Knowledge Be Distributed?
The Dynamics of Knowledge in Interdisciplinary Alliances:
Year Three Executive Summary

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The goal of the Distributed Knowledge project (DK) is to investigate distributed knowledge processes among multidisciplinary teams and the roles that technology and group context play in these processes. We focused our initial inquiry on the six scientific Applications Technologies teams of the National Computational Science Alliance, funded through NSF’s PACI program. During Year One of the project (10/99-10/01), we focused on refining our research questions and methods, and on conducting initial investigations. During Year Two of the project (10/00-10/01), we expanded our inquiry into distributed knowledge to include other collaborative research efforts. During Year Three of the project (10/01-10/02), we have completed the data collection for several research efforts, have presented and published on these efforts, have begun reflecting and reporting on our own collaborative research processes, and have laid the foundations for further research.

The current document reports on the third year of the project. This summary describes project highlights (for PIs as well as graduate students), updates some of the research efforts, and lists project-related publications. The web site is the most comprehensive repository for and summary of our research projects. It also supports group members by integrating several new collaborative technologies, including blogs, biography tools, calendar services, inquiry-based learning templates, writing tools, and password-protected spaces for sharing documents. We continue to develop the DKRC consortium. The web site is set up not to represent just our project, but to promote multi-project collaboration.

Project Highlights

In this section, we list a few from the third year:

Bertram Bruce and Caroline Haythornthwaite taught a graduate-level seminar (LIS 450) dedicated to Distributed Knowledge at the University of Illinois at Urbana-Champaign (15 doctoral students)

Caroline Haythornthwaite represented the DK Group at the NSF-KDI workshop, New Orleans, LA. Organizers: Sara Kiesler, Johnathon Cummings.

Geoffrey Bowker was appointed Chair of the Department of Communication, University of California, San Diego.

Caroline Haythornthwaite was promoted to Associate Professor, Graduate School of Library and Information Science, University of Illinois at Urbana-Champaign (effective August, 2002).
Nicholas Burbules was appointed as Grayce Wicall Gauthier Professor, Department of Educational Policy Studies, University of Illinois at Urbana-Champaign (effective August, 2002).

Joseph Porac and James Wade have served as visiting faculty at New York University's Stern School of Business.

Bertram Bruce presented at a National Academies Symposium on the Role of Scientific and Technical Data and Information in the Public Domain on September 5-6, 2002 in Washington, DC.

**Graduate Assistant Updates**

Graduate students working on the project have had many accomplishments in the past year, among them:

Michelle M. Kazmer completed her doctorate and has been appointed Assistant Professor, School of Information Studies, Florida State University, Tallahassee, FL (effective August, 2002).

Sarai Lastra was appointed Assistant Professor, Graduate School of Library and Information Science, University of Puerto Rico, Rio Piedras, PR (effective January 2002).

Karen Lunsford was awarded a University Fellowship, Center for Writing Studies/English Department, University of Illinois at Urbana-Champaign. (2002-2003).

Harald Fischer recently defended his dissertation proposal, which is a study of the effects of acquisitions and divestitures on human capital movement in the US paper industry.

Chris Hagar has recently joined the project.

**Research Updates**

The full range of research projects and educational outreach activities may be found on the DKRC. In this section, we list a few recent accomplishments:

*Interdisciplinary collaborations and learning*

We have completed much of the data collection for several projects involving interdisciplinary collaboration as well as learning (including electronically supported learning), and we have begun to analyze and publish the results. DK members using bibliometric analyses have consolidated their database on the publication practices of two Alliance teams, and have submitted reports on the teams' patterns of publication for review at Research Policy and for the 2003 Academy of Management annual meeting. Other DK members using qualitative, social network, and ethnographic methods have projects in progress and conference papers on the following topics:

(a) "Interdisciplinary knowledge exchange," (presented conf. paper). This paper
reports preliminary results of research exploring the nature of exchanges in interdisciplinary knowledge work.

(b) "The generative dance in pursuit of generative knowledge," (accepted conf. paper). This paper describes the knowledge processes in a group working together around a sensitive topic and the way in which this enacts a generative dance between knowledge and knowing (Cook & Brown, 1999).

(c) Collaborating across Disciplinary Boundaries, (project in progress). This project surveys inter- and intra-disciplinary work patterns of researchers in a variety of science and social science teams.

(d) Collaboration around Knowledge and Artifacts: The Case of an Educational Initiative, (project in progress; data collection complete). This research explores the social processes that led to the construction of a technical artifact, in this case a database of educational resources.

(e) "Re-media-ting scientific publication: Re-distributing the laboratory, disciplinarity, and professional identity," (dissertation chapter in draft). This chapter reports on how scientists adapt their argumentation processes to accommodate changes in distributed publication practices.

Emergent methodologies

This year, the DK group has continued to develop ways to bring together quantitative/bibliometric and qualitative/ethnographic methods. By reflecting on our own processes, we aim to contribute to literature on multidisciplinary collaboration and to programs that seek to foster such collaboration. Materials have been drafted on the challenges and benefits gained from combining work from various perspectives in understanding collaborative processes. Some of this work will be presented at the American Association for the Advancement of Science conference, Feb. 2003. Another article in progress reports on the ethical challenges that are emerging as more and more data and reports are digitized, made searchable, and yet placed under restrictive copyrights. Finally, a paper in progress aims to clarify p-star analysis for social networks.

Technologies and outreach projects

For the first two years, we focused primarily on technologies that allowed DK to collect and share information on the groups under study. These tools facilitated our video/audio conferencing, interview transcription, and social network analyses. As the DK group itself became distributed, we also began to implement technologies to further support our need for interdisciplinary collaboration. To that end, we have adopted and adapted tools to support individual or small-group projects as well as research efforts undertaken by the whole DK team:

Distributed bibliography: We have combined and modified several digital library tools to create and maintain a distributed, online bibliography. It allows individuals/small groups to collate their own collection and to tag materials according to a unique category name. At the same time it allows large groups to compile materials from several sources, which has facilitated the collection of almost 500 entries, which pertain to distributed knowledge issues.

Distributed inquiry: Several DK members continue to support The Inquiry Page as a practical, award-winning educational extension of our research into how people learn and collaborate in distributed environments. Several other research groups also now support The Inquiry Page, and together we have created resources to increase the functionality of online, collaborative workspaces. We call the sharing of these resources "distributed inquiry." Each contributing group may now tag its own inquiry units yet also share them with other groups and the public, maintain a group-specific as well as collective events calendar, and access a dynamic member directory.
Blogs: A renewed, public interest in blogs (or web logs) has caused us to re-assess our own blog use, so that we are now employing them to create dynamic, collaboratively generated pages for our DKRC website.

Please view the DKRC website for more information about these technologies and how they support multidisciplinary, collaborative research and education.

Publications

Our own distributed knowledge and several of our research results are evidenced in a wide range of publications. Some of the year three publications are listed below. A complete list of publications and the full texts for many of these entries are available online:


Bruce, B. C. (book manuscript.). *Literacy in the information age*.


Bruce, S. P., & Bruce, B. C. (2002). University students promoting science in the community. In R. Garner, Y. Zhao, & M. Gillingham (Eds.), *Hanging out: Community-based after-school programs for children*, (pp. 41-58). Westport, CT: Greenwood.


Burbules, N. C. (2002). The Web as a rhetorical place. In I. Snyder (Ed.), *Silicon literacies*


