Moving Toward Knowledge-building Communities in Health Information Website Design

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ABSTRACT

In this paper, we have described our work with the *Arthritis Source* website and our efforts to develop a community of learners in that context. We argue that given proper architectural support, efforts to listen to learners can effectively foster collaboration between the authors of an informational website and its visitors and help community building among its users through a dynamic knowledge base.

Keywords

Knowledge-building community, Community of inquiry, Informational website design, Content management system

INTRODUCTION

Informational web sites are not traditionally seen as collaborative technologies. In this paper, we wish to re-examine this common notion by describing the collaborative learning underpinnings of our current and future work on a medical information web site, the *Arthritis Source*. In this paper we discuss how the design of a medical information website has evolved to embody a knowledge-building community perspective (e.g., Brown and Campione, 1990; Scardamalia and Bereiter, 1994; Hewitt and Scardamalia, 1998) as the driving framework. This redesign transforms the *Arthritis Source* from its original state as a static, encyclopedic object into a community of inquiry and practice in which users learn from each other's questions and shape the growth of the knowledge base. In this effort, the designers, content authors, and users of the website each learn from the others.

Our redesign of the Arthritis Source has been guided by both the current research on medical information websites and by our own specific concerns. A variety of current studies on the roles and effectiveness of medical websites have discussed some common shortcomings and related design decisions (e.g., Berland et al., 2001). In our research, we have moved from describing the users and understanding the community of people we hoped to serve to focusing on the users' current knowledge and goals in visiting the site. In this project we have attempted to address some of these problems and also create a systematic solution to issues of content maintenance and site development that meet users' changing needs. Most importantly, we wanted to be able to help patients find answers to their questions concerning their conditions. We are working on a system of site architecture and content development that can be driven explicitly by both our understanding of site users' information needs and by site users' interactions with the site over time. As people use the site, they will collaborate with the content authors to create an information resource that serves users' purposes and will change with their needs. We are currently working toward a new vision for the Arthritis Source – a website that looks like an informational website, but is a community of inquiry.

DIVERSE LEARNERS, BUT SHARED NEEDS

Our earliest work with the Arthritis Source consisted of various efforts to "know thy learner" so that we could create a site that was more learner-centered (Turns and Wagner, submitted). We used a variety of methods to learn who was visiting the website and what they were doing during their visits. One of our most comprehensive activities has been our use of an online survey in which users of the site provide us with information about themselves and their visit (Turns and Liu, 2000). Based on survey results, personal interviews, and emailed comments, we know that while our user population is widely varied, there are some common needs and characteristics. The majority of the participants identified themselves as patients with arthritis (61%) or friends and relatives of an arthritis patient (8%). Patients have many different information needs and goals when they visit the site, but many patients share very similar needs. The complexity of some of these needs as well as the shared nature of the various goals suggests that a potential community of learners already exists. Patients also come to the site with existing knowledge, and sometimes with existing misconceptions. Many of these misconceptions are also shared (or originate from common sources), suggesting that patients may be positioned to benefit from previous visitors' learning—the essence of a knowledge-building community.

SUPPORTING A KNOWLEDGE-BUILDING COMMUNITY THROUGH DESIGN

The extent and complexity of the questions brought to the site by our learners convinced us quickly that no static system could effectively satisfy all the users. The knowledge-building community perspective suggested to us that instead we should design a system in which the learners influence the content, over time tuning the system to their needs.

At the center of our design is the site content, the result of a collaboration between arthritis patients and site designers in which the designers learned about the patients' information needs. The content of our site has changed dramatically as we have listened to the needs of the community.

This content, while accessible in the usual browsing mode, is also tailored via an open-source content management system to support a question-based navigation system. This system will allow learners to ask free text questions, and it will respond to them with authoritative, relevant text that has been developed to be learner-centered. The system will respond to such questions in two possible ways, each supporting a kind of community knowledge building. After a learner asks a question, the system returns several articles that may address the topic. If the learner cannot find any useful information by asking or rephrasing the question, he or she is invited to submit the question to the content developers. These developers will then be able to add appropriate content to answer the question or improve the search system.

Learners who receive useful answers from the system are benefiting from the knowledge-building efforts preceding their use. In the future, we hope to allow users to contribute to the knowledge embedded in the site by sharing with later users some of their constructions of the site. Learners who submit a question for the content developers contribute to the knowledge community both by driving content creation and by extending the designers' understanding of how to interpret questions.

This system only exists in partial form at the writing of this paper, so several challenges remain. One of the most important is assessing the individual and/or community learning that results from this enhanced architecture. As we move forward, we anticipate that we will also identify new opportunities to add learning features. Many additions are possible, and we need to think carefully about which will add to the knowledge-building community and which will merely distract.

Efforts to study web-based information systems in context of patient education and lifelong learning can shed light on issues broader than just health information websites. Issues such as learner-centered curriculum design, collaborative knowledge-building, and dynamic website content creation may be of interest to all information website designers.

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