Writing the Experience of Information Retrieval: Digital Collection Design as a Form of Dialogue

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ABSTRACT

In the context of digital libraries and other online resource collections, the substance of interaction is generated to a large degree through the selection, description, organization, and arrangement of the aggregated items. Within information studies, researchers [such as 32, 6] have shown how individual events of selection and description inevitably form judgments about the collected materials. This paper describes a process in which designers purposefully use the elements of selection, description, organization, and arrangement to "write" a resource collection as a form of rhetorical expression. The design process was implemented in two classroom settings. In the more successful second implementation, the role of the audience in structuring a rhetorical interaction was emphasized, and collection design was conceptualized as designing a dialogue between author and audience. The formalized critique of existing collection designs was a key element in enabling this dialogic orientation.

Author Keywords

Experience design; digital collections; rhetoric; criticism

ACM Classification Keywords

H.5.2 Information Interfaces and Presentation: Misc

General Terms

Design

INTRODUCTION

Within information studies and computer science, we tend to conceptualize information seeking as a simple, well-defined task [16]. In this mode, one approaches a resource collection, such as the recipe Web site Epicurious, with a specific need in mind, such as finding a casserole recipe for the office potluck. Accordingly, there is an equal, longstanding tendency to characterize the ideal information supplied to address that need as objectively isolated, neutrally described fact [35]. If I seek potluck casserole recipes, then lo, that is what I should receive.

However, just as philosophers of science, such as Bryant and Ereshevsky, have complicated the notion of scientific fact and its accompanying taxonomy [11, 19], emphasizing the pragmatic and interpretive elements involved in providing accounts of scientific data, scholars of classification have repeatedly shown how, within resource collections such as libraries and databases, events of item selection, attribute definition, and category assignment inevitably form interpretive judgments about the collected materials [see, for example, 32, 6; this orientation is pervasive in current classification research]. An objective neutrality, in other words, is an untenable design principle for resource collections, be they composed of physical materials or digital ones.

To continue the office potluck example, if the casserole recipes that I receive all contain meat products, then Epicurious is communicating a rhetorical position to me, that main dishes should include meat. Similarly, if the recipes feature inexpensive ingredients, then Epicurious is telling me that potlucks are informal, not elegant. In fact, whatever the search results might be, Epicurious will be expressing its own idea of what a "potluck casserole" means; this interpretive activity cannot be avoided. As judgments accumulate throughout the Web site, they form a larger perspective on food, on preparing and eating it, and even its cultural significance. As a user of Epicurious, I receive more than instructions for making turkey tetrazzini, or whatever "potluck casserole" I choose; I receive a whole approach to cooking, as expressed through the selection, description, and organization of recipes.

This notion, that resource collections communicate a specific interpretation of their contents, has been widely accepted in classification research and other related areas, such as archival science and museum studies [see, for example, 17, 27]. However, implications for the collection designer's task have yet to be widely explored. For example, practice guides and standards for controlled vocabularies continue to portray the designer of these systems as a compiler of data, who documents a subject domain by objectively identifying categories to describe it [10]. In contrast, a design process that directly acknowledges the difficulties with a neutral perspective would portray the collection designer more like an author, who forms positions and determines how to express them creatively and persuasively through the selection, organization, and arrangement of resources in a collection. Users would interact with resulting collection in a manner

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CHI'12, May 5–10, 2012, Austin, Texas, USA.
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similar to the "information flaneur," in which users encounter materials for various reasons of engagement, and not just query resolution [16]. In this perspective, an information system's usefulness and interest is located partly in its ability to enact an interpretive frame that differs from a user's current way of thinking and that challenges existing ideas and expectations regarding the collection's subject matter, in the same way that the flaneur prowls a city to experience its eclectic mix of people, places, and things. If my encounter with Epicurious expands my notion of "casserole" by including dishes like Asian hotpots and Mexican tingas, in addition to standard American fare, then I have found some new ideas, in addition to recipes.

This paper describes a continuing project to enact a design process for resource collections that views this design space as a rhetorical situation, rather than a scientific problem. The motivating research question asks what it means to "write" a digital resource collection, and what it means to be the author of one. The language of classification theorists, such as Beghtol and Kwasnik, often refers to information systems as "making arguments" or "forming theories," which clearly suggests the domain of rhetoric [6, 29]. However, both the materials of expression and the means by which the user audience engages with this expression are less certain in the resource collection context than with common forms of rhetorical communication, such as linear text. We know how to use sentences and paragraphs to write an essay, and we can expect that our audience will read it from beginning to end, and that our audience will be reading the essay primarily to engage with our ideas, even if they don't end up agreeing with them. In contrast, it's less clear how we deploy the mechanisms of resource selection, organization, and metadata description to create sustained, persuasive arguments, especially when our user audience shapes their own path through the system, and when that audience may have their own information-related goals that do not entirely align with our authorial vision. This study suggests that the form of rhetoric articulated through digital resource collections is most effectively described as designing a dialogic experience between author and audience, as opposed to making the audience agree with what the author proposes. This conceptualization aligns with Kenneth Burke's idea of rhetoric as a process of *identification* [12]. For Burke, rhetoric becomes a means of bridging differences in beliefs, values, and goals; successful rhetorical expression illuminates a path to joint action or understanding, framed by shared interests. In the context of resource collections, the act of persuasion requires active audience engagement to structure the interactive experience; the author acknowledges and works with, instead of against, that audience power. Such notions of audience engagement enacted through the structure provided by an author are closely related to the reader-response school of literary theory as exemplified by Wolfgang Iser [28]. (While the influence of Bakhtin [2] is noted whenever the concept of dialogue is linked to expression, his work is less central to the orientation used here.)

The concept of persuasion at the heart of this research project is based in the tradition of rhetoric, in which the goal is to advance a position and potentially achieve agreement regarding that position. Bogost has articulated the rhetorical stance in the context of video games and noted the differences between this approach and that of persuasive technologies, as seen in the work of Fogg and others [8, 22]. Persuasive technologies encourage users to act in accordance with existing plans; for example, in Consolvo's UbiFit project, an ambient display motivates users to achieve exercise goals they have already set [14]. In contrast, rhetorical approaches attempt to persuade people to adopt new goals or accept new ideas.

BACKGROUND

Previous work has described the initial creation of a design process focused on the development of rhetorically focused resource collections and an implementation of that process in a classroom environment [20, 21]. To provide context for the subsequent implementation reported here, I present a brief overview of the process as deployed in the first implementation.

The design process for rhetorical collections includes these activities:

- Learning.
- Envisioning.
- Strategizing.
- Sketching.
- Revisiting, reflecting, and refining.
- Analysis and critique.

The following sections describe each activity. It should be noted that, while many of these activities are not uncommon in design-oriented fields, they are all unusual in the context of resource collection development, as seen in library and information studies. This is because, in the traditional mode of information seeking, the emphasis is on finding the correct, objective way to describe information, and not on the user experience. While, as described in the introduction, the ideal of neutrality as a design principle has been convincingly refuted, this conceptual shift has yet to translate to the collection design space.

Learning

The designer acquires more information about:

- The subject area of the collection being designed.
- The structure, content, and format of potential documents to include in the collection.
- The user audience being targeted.

The designer performs this research following standard practices for each information type, such as domain analysis for the subject area, interviews and focus groups for user research, and content and genre analysis of potential documents.

Envisioning: persona and scenario development

Personas encapsulate characteristics of a selected target audience [34] and synthesize user research in a way that forms believable characters and not merely data composites [33]. Next, the designer imagines a diverse set of experiences that show how these personas might interact with a potential document collection [13]. By reflecting on these scenarios, the designer can begin to perceive the extent of the design problem.

Strategizing: a plan to achieve the nascent vision

The designer uses ideas generated from initial scenario development to postulate a tentative strategy for how the still-amorphously-defined information collection might communicate its position to the identified audience. This strategy is presented through a systematic design document, called the *brief,* which includes the following sections:

- Authorial goals, or the position being articulated on the collection's subject matter.
- Audience characteristics, including beliefs, values, and information needs.
- Design rationale, or the strategies of resource selection and description that convey the position to the audience through the document collection.

Sketching

The designer synthesizes the ideas generated from the Envisioning, Learning, and Strategizing activities by sketching how different collection elements—selected resources, descriptive information, and access mechanisms—come together as a coordinated work of expression.

Revisiting, refining, and reflecting

Synergistic development of scenarios, brief, and sketches continues until a viable design emerges through the intersection of the three documents, which together represent the potential audience experience of the collection (through personas and scenarios), the communicative goals and strategies of the designer/author (through the design strategy brief), and the union of resource selection, description, and access mechanisms that support the audience experience and communicative goals (through the sketches). Together, these documents represent a considered negotiation between an author's desire for expression, an audience's information needs and associated tasks, and the shape of the subject domain.

Analysis and critique

The candidate design is systematically examined and revamped before proceeding to implementation, in accordance with practice in many design fields [36, 39].

Design outcomes

The outcome of this process comprises the three related design documents developed during the coordinated activities: user scenarios, strategy brief, and sketches. Together, these documents present a unified design vision for a collection of information resources that is organized and arranged to communicate a unique perspective on the subject matter that it makes accessible.

Embarassed by my own persona: reservations about authorship

In the first classroom implementation, conducted in the spring semester, 2010, 15 master's students in an information studies program used the design process to create digital video libraries that each presented a unique perspective within the same subject area of "sustainability." The students selected their collection resources from a common pool of videos, and they all worked in an easy-to-use digital video library environment, the Open Video Digital Library Toolkit [25], for "sketching." These constraints focused the students on the primary expressive mechanisms of description (via abstracts, titles, cross-references, and other video metadata), organization (via the creation and assignment of browsing categories), and arrangement (via the establishment and description of thematic subcollections), as opposed to visual design or interface elements, which the toolkit standardizes.

Students successfully created resource collections that presented rhetorical positions on the subject matter, as expressed through the mechanisms of resource selection, description, organization, and arrangement [21]. However, student reflective essays showed lingering discomfort with the idea of authorship. The findings suggested that students could not clearly envision the role that an audience would have in shaping their own interactions with the collections; accordingly, this made the student authors feel like they shouldn't assert their own ideas too strongly. For example, one student worried that her authorial persona "catered" to her audience instead of "challenging" them, and she felt "embarrassed" at this "manipulation." The students had instinctively formulated their rhetorical strategies to work *against* audience power, by saying what they thought an audience would want to hear, instead of *with* audience power, by imagining their designs as a conversation between equals.

To address these issues, I planned a second classroom implementation of the design process, which reoriented the idea of authorship as one of two actors in a dialogic process, with the audience taking a role that demands equal presence. In this view, a compelling interaction requires that both participants, author and audience, take an active role in the retrieval process; both are, in effect, writing not just the resource collection, but writing the experience of retrieval. I hoped that by adapting the idea of writing to encompass the structuring of a dynamic process, as opposed to a static product, the student designers would be more likely to both acknowledge the equal agency of the audience and to embrace their own agency more fully. Such notions of engaged audiences have precedent in rhetoric as well as in the reader-response school of literary theory.

METHOD AND RESEARCH QUESTIONS

To encourage these changes, I made the following adaptations for the second classroom implementation:

- Throughout class sessions, I referred to the design product as "writing the collection experience as a type of performative document" as opposed to writing a collection, and I described the author's role as negotiating a balance between authorial and audience goals, "in other words, as designing a dialogue."
- I expanded the Learning activity to include a written, directed critique of an existing resource collection, with required consideration of author, audience, and critical perspectives.
- I elongated the Analysis and Critique activity to incorporate three critiques over separate weeks, one each from the perspective of author, audience, and critics.

My corresponding research questions were:

- How did designers' conceptualizations of their process, their product, and their role change from the first implementation to the second?
- How did collection designs change from the first implementation to the second?

These research questions limit the scope of the project to the ways that notions of dialogue and audience power affect the designers, and accordingly any changes in the implemented designs. This project is not concerned with actual audience reactions. Such an approach is not unusual in rhetorical and literary criticism, in which an "implied audience" is read, by a critic, through its instantiation by an author in a text [7].

I initiated the practice of formalized criticism as a precursor to design, in addition to the practice of critique from within the design process, to help bridge a perceived gap in both the critical skills and the confidence of the student designers. The "crit" session as a means of generating new knowledge by reflecting on in-progress ideas is an established activity in design fields, including architecture and HCI [36, 38, 23]. However, in most traditions of design practice, the design judgment employed by experts in the context of a crit session is seen as the result of long experience as a designer, with accompanying standards of rigor generated through the conventions of the design community, to which a student is exposed over a long period of what Lave and Wenger would describe as legitimate peripheral participation, or gradual accumulation of expertise, responsibility, and standing [30]. In the first implementation of the design process, the student designers did not feel sufficiently confident to apply critical judgments to their own work and that of their peers; they confided their misgivings about their practice as authors only in final essays.

A more formal employment of criticism, as finds expression in art, literature, and culture, in addition to design fields, has been advocated for interaction design [31, 3, 5]. In this kind of interpretive analysis, the critic attempts to uncover a deeper significance for a text or artifact, often by combining the technique of close reading, or detailed, sustained interpretation of the text, with a particular theoretical orientation (such as a reading of Shakespeare's *The Tempest* from the perspective of post-colonialism). Incorporating a more structured episode of such critical inquiry into the collection design process seemed an especially appropriate means to developing a keener sense of design judgment in this case, because of the analogy with writing. In composition courses, textual analysis is often taught in conjunction with writing skills, and budding authors are often told by experienced practitioners to read others' work, as well as to write themselves. Moreover, because case studies that incorporate systematic criticism into design process have not previously been reported in HCI literature, this project provides an opportunity to demonstrate the value of formal critique in actual practice.

To develop critical skills in preparation for the critique assignment, I structured three class sessions to address each of the three perspectives I had designated for their analysis: that of the audience, of the author, and of the critic. In the audience session, we discussed how an audience generates meaning or "performs" a text through reading it; in the author session, we discussed how authors create a text that their audience will enact, in some sense how authors "construct" through their choices an audience persona for the actual audience to take on; and in the critic session, we discussed how the critic might take an overall look at how this audience/author relationship is negotiated in the text. For each session, we prepared by reading articles from literary studies, rhetoric, and interaction design, and, importantly, we put these notions into practice by applying them to example resource collections that had been created in the previous classroom implementation.

We did not begin developing any of the design products—personas and scenarios, briefs, sketches—until after the critique project was completed. Then, after initial drafting of the three products, the three-fold structure of author, audience, and critic returned in the Analysis and Critique phase of the process. The author-focused critique of in-progress designs was a peer critique, conducted in a structured format; for the audience-focused critique, four students from the first classroom implementation returned to take on the role of audience members; and for the critic-focused critique, four faculty experts attended.

FINDINGS

Five students enrolled in the second class implementation. While the sample size was small, the richness of the collected data, as accumulated through a 15-week semester, greatly lessens the impact of this limitation. To avoid borrowings from the first class to the second, the second class designed collections in the subject area of "alternative medicine and wellness" instead of sustainability.

Students described their roles as authors, their relationship with the audience, and their process as designers in markedly different terms than students in the first implementation. The collection designs were also qualitatively different, in consistent ways, from the first implementation. The following two sections provide details for each of these assertions.

Participant notions of roles and goals

The students in the second implementation used strikingly different language to describe their roles as authors. This altered conceptualization of authorship also led to a different way of framing their design situations and accompanying work process.

In the first class, students tended to adapt their own messages to what they imagined the audience would like to hear, more in the way that one would appease an opponent, instead of in the way that one would cooperate with a partner. For example, 11 of 15 projects emphasized how simple personal actions, such as recycling household waste, could contribute to sustainability. In providing rationale for this choice, one student explained that her collection "strives to present the videos and accompanying text in a casual, low-commitment manner...The audience needs simple ways to impliment [sic] the conceptual ideas into their day-to-day lives."

None of the students actually thought that using vinegar and water to clean one's kitchen counters would result in a sustainable society; they all believed that such problems required long-term infrastructure solutions in addition to individual minor actions. But they took these positions in their collections because they thought that, in the words of one student, being "positive and encouraging" would be more persuasive to a broader audience. In the end, though, some of them felt like pandering manipulators, fooling people into believing that if they went to the farmer's market and bought local produce, they would save the planet. Because they didn't see the audience as active agents to really engage with, they shrank from their own potential power as authors.

In contrast, students in the second class assigned equal importance to their ideas and the goals of the audience. Instead of thinking, as the first group did, "I believe X, but I think the audience will respond to Y, so I will design my collection to speak Y," participants in the second implementation understood their problem space as "If I believe X, and the audience thinks Y, how can I get from Y to X?" They framed their challenge as, in the words of one participant, "Dave," "facilitating understanding for the audience," by first acknowledging their differences and showing how those differences could be bridged, as opposed to ignoring the differences and pretending that they didn't exist. Another participant, "Isabella," elaborated that she had attempted to "construct a critical audience, willing and able to evaluate conflicting arguments," as a means of structuring a conversation between author and user. A third student, "Edie," contended that "ultimately, the negotiating of these [author and audience] spaces in an exercise in relationship building," further commenting that "if the author recognizes and respects the partnership and cooperation necessary to create a persuasive and interactive experience, neither author nor audience will feel compromised."

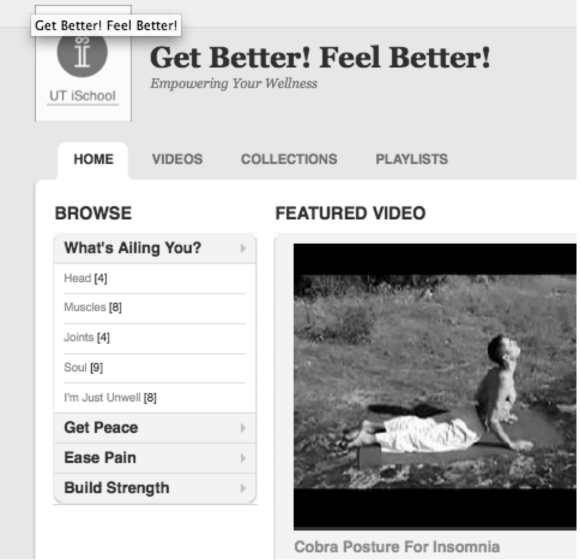


Figure 1: Browsing categories informed by using personas to model potential author/audience relationship

One way in which these different conceptions of author/audience roles played out in design work was in different attitudes toward personas and scenarios for the two implementations. In the first class, students were skeptical of personas as a design tool. As one participant complained, "I am troubled in placing too much stock into fictitious people, regardless of the level of believability of their actions and who they represent. I also do not know if real people are necessarily better..." Students in the second class, however, embraced personas as a vital element of their authorial process. Another participant, "Jessica," described her authorial goals as showing the holistic benefits—mind, body, and spirit—of wellness practices. Her personas, however, were a waitress and a food truck owner who were both short of money and on their feet all day; they wanted relief from chronic pain without the requirement of health insurance, which they didn't have. Jessica then puzzled over how to provide quick access to material related to physical conditions while not ignoring mental and spiritual connections to bodily systems. As depicted in Figure 1, one way that Jessica managed this problem was to include a browsing category for "ailments" but to include within it not just areas of the physical body but also “soul,” and, provocatively, “I’m just unwell,” a category that brought together a diverse assortment of material, from South American spiritual cleansing to clearing out nasal passages with a neti pot.

While participants in the second class did characterize their roles as authors consistently, they did not always find it easy to negotiate the author/audience balance they described. Indeed, Edie noted how at one point, she felt like she and her audience (as exemplified by her personas) were in a dysfunctional relationship, not one of equal partners:

I found myself time and time again too willing to compromise, too willing to lose my own voice in order to give the people what they want. I was the kind of partner who apologizes for things she shouldn’t be sorry for and standing down when she should be holding her ground.

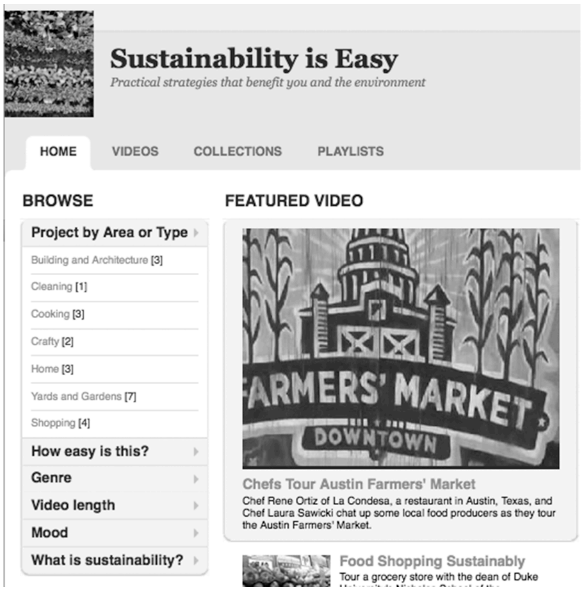
In contrast to students from the first class, however, Edie reasoned that being too conciliatory towards audience needs was, in the end, a disservice to both herself and to the audience. Audience values must be taken into account by the author, but the goal is to facilitate understanding, not to let the audience take over the discourse entirely. As Dave put it, “if a designer prioritizes audience needs to the point that the message is lost...what’s the point?”

Participant design innovations

The collection designs themselves showed qualitative differences from one implementation to the next. In comparison with the first class, the collections from the second implementation were more thematically cohesive and more creatively provocative.

To provide evidence for these claims, I present one case study from each class. The case study from the first class, Sustainability Is Easy, was selected by all the students in the second class as the object of their written critiques, so I can include their interpretations of it.

Through its selection, description, and arrangement of videos, the Sustainability Is Easy collection, shown in Figure 2, asserts that simple individual activities can nonetheless increase overall sustainability. Its featured video, for example, depicts a trip to the farmer’s market to buy locally grown food. Its top browsing category groups material by the type of household project described in a video (with no categories for larger-scale projects undertaken by communities, governments, or corporations), and its second browsing category categorizes videos based on the degree of easiness for each project. The collection’s relentlessly upbeat tone (“Drip irrigation is a great, simple way to save water in your garden”) emphasizes the hope that a little bit of individual effort can solve a big problem.



Chefs Tour Austin Farmers' Market

Chef Rene Ortiz of La Condesa, a restaurant in Austin, Texas, and Chef Laura Sawicki chat up some local food producers as they tour the Austin Farmers' Market.

Food Shopping Sustainably

Tour a grocery store with the dean of Duke

Figure 2: Sustainability Is Easy collection

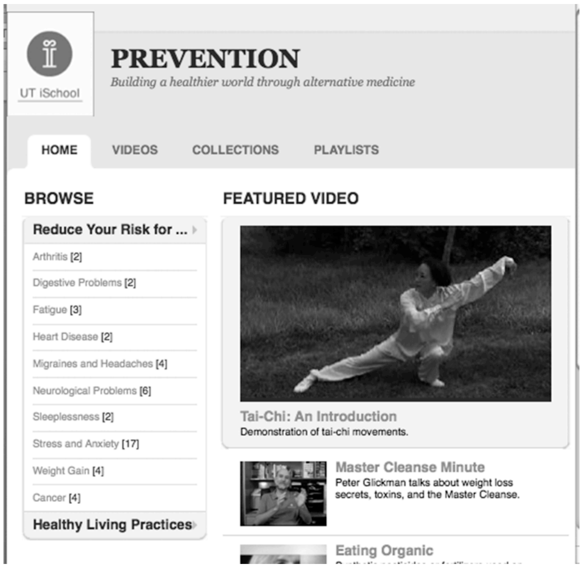
However, while the general position advocated by Sustainability Is Easy is direct and clear, its expression is muddled by trying to directly address a scattershot set of potential audience information needs: for example, browsing menus for mood, genre, video length, and general sustainability definitions have no connection to the overall rhetorical goals. Students from the second class criticized these diverse access mechanisms as contributing to conceptual incoherence and a resulting dilution of rhetorical power. Isabella suggested that this fragmentation emphasized the shallowness of the primary message, lessening the impact of the experience:

...the navigation elements do not present a coherent path to understanding how sustainability is easy. Because of this, we cannot participate in a transformative narrative...

In other words, without providing some evidence for the assertion that the videos in the collection will really enable the audience to contribute to sustainability, the audience has no real motivation for either understanding or action. Dave concurred, writing that “people need a reason beyond the fact that something is easy to make a switch to sustainable living practices.”

Edie elaborated that the collection design, while perhaps meant to be encouraging, inscribes the audience as incapable of understanding the broader context of sustainability and contributing to larger-scale action, suggesting that “the social space the design constructs is one where consumers needn’t take much responsibility.” Edie’s comments imply a lack of trust and respect on the part of the Sustainability Is Easy author toward the audience. Overall, the students’ critiques of Sustainability Is Easy showed how, despite its clearly conveyed message, the collection strains to work *against* perceived limitations—as opposed to *with* those constraints.

The collection designs from the second implementation, in contrast, emphasized thematic consistency over access diversity, as a mechanism to facilitate understanding of the author’s position by an audience with different goals,


UT iSchool
PREVENTION
Building a healthier world through alternative medicine
HOME
VIDEOS
COLLECTIONS
PLAYLISTS
BROWSE
FEATURED VIDEO
Reduce Your Risk for ...
Arthritis [2]
Digestive Problems [2]
Fatigue [3]
Heart Disease [2]
Migraines and Headaches [4]
Neurological Problems [6]
Sleeplessness [2]
Stress and Anxiety [17]
Weight Gain [4]
Cancer [4]
Healthy Living Practices
Tai-Chi: An Introduction
Master Cleanse Minute
Eating Organic

Demonstration of tai-chi movements.

Peter Glickman talks about weight loss secrets, toxins, and the Master Cleanse.

Figure 3: Prevention collection

beliefs, and values. Dave's collection, our primary case study, focused on the relationship between alternative medicine practices and maintaining overall wellness. Dave used the theme of prevention to concentrate this idea, as shown in Figure 3.

In contrast to the diverse set of browsing categories employed by Sustainability Is Easy, Prevention includes just two thematically related categories: Reduce Your Risk For...which includes potential health problems, and Healthy Living Practices, which includes alternative systems that may address those problems (in addition to other problems). Dave refined these categories over many weeks, remarking that this process "was probably one of the most difficult parts of authoring this collection, and one place where the tension between author and audience was most evident." Dave struggled to structure and label these categories in a way that hinted at common ground between author and audience. Dave's personas were coming to the collection with specific fears of, or perhaps experience with, particular symptoms or conditions, whereas Dave wanted to emphasize the broad benefits of holistic practices for preventing many connected problems, not just isolated ones. If Dave called the category something like "Symptoms and Problems," though, then the idea of prevention was lost.

In addition to encouraging the audience to think about the goals of health-related practices in a different way, from a focus on alleviating symptoms to an awareness of larger networks and their overall maintenance, Dave wanted the audience to consider a wide set of knowledge systems as having bearing on these issues. Accordingly, the categories presented under healthy living practices encompass a variety of traditions, as Figure 4 illustrates.

The audience is challenged to consider the relationships between "angels," "acupuncture," and "shamanism" and

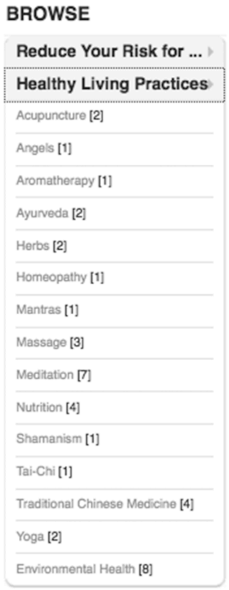

BROWSE
Reduce Your Risk for ...
Healthy Living Practices
Acupuncture [2]
Angels [1]
Aromatherapy [1]
Ayurveda [2]
Herbs [2]
Homeopathy [1]
Mantras [1]
Massage [3]
Meditation [7]
Nutrition [4]
Shamanism [1]
Tai-Chi [1]
Traditional Chinese Medicine [4]
Yoga [2]
Environmental Health [8]

Figure 4: Categories under Healthy Living Practices challenge audience preconceptions of medical knowledge

the conditions under which such connections might hold. Even enthusiasts of herbal remedies and Chinese medicine might be initially taken aback at seeing these practices grouped with "angels," but this placement does underscore the holistic—physical, mental, spiritual—emphasis of many alternative medicine traditions. All the student designers in the second class felt empowered to pursue such creative and evocative pathways; they felt confident that by creating a thematically consistent collection that considered, but was not limited to, initial audience goals and beliefs, the audience would be able to find its bearings and productively engage more challenging aspects of the rhetorical artifact they had created. This consistency enabled a sort of trust that provided groundwork for a more equal author/audience relationship. As Isabella explained, "the designer should establish a relationship by giving small fulfillments on the emotional promise, and making further promises." In other words, a consistent structure has the potential to enable a larger meaning to emerge when the user interacts with it. However, although the author enables this meaning, the author does not determine it; the ultimate expression relies on audience action.

In Isabella's collection, the browsing categories offer a narrative progression that hopes to demonstrate how "alternative medical systems, no matter how strange, have internal logics and may be understood by examining them as systems of knowledge." Figure 5 shows how the logical progression of browsing categories, from Ailment to Cause of Ailment, then Healing Acts, Explanations (systems in which the healing acts make sense) and finally Perspectives (different ways to react to and assess these knowledge pathways) provides context for the initially quite strange items within any particular category.

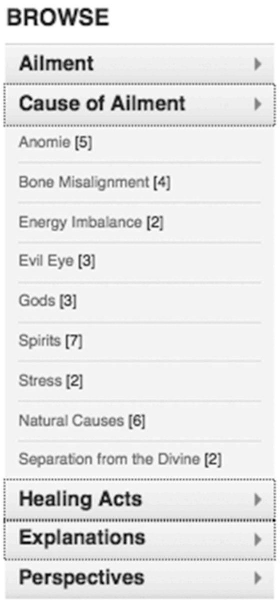
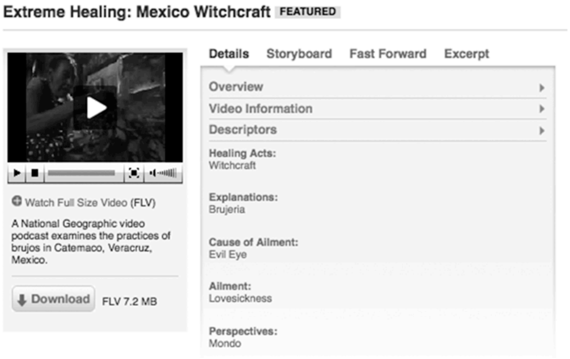


Figure 5: Browsing categories in Causes and Cures collection illuminate the logical structure of alternate knowledge systems

Individual video records show potential narrative flows to link these concepts, as Figure 6 depicts: the ailment, lovesickness, is caused by the evil eye, and healed by witchcraft; this progression makes sense in the knowledge system of brujeria, and this video approaches the system from a "mondo" perspective. (What does "mondo" mean? The audience can pursue this path by looking through the items placed in this category.)

DISCUSSION

On a basic level, these findings provide additional support for preliminary conclusions that the design process used in this study does facilitate the creation of digital resource collections that embrace their identity as rhetorical artifacts, where the selection, description, organization, and arrangement of included materials (here, digital videos) produces a coherent position on the collection's subject matter [20, 21]. These findings also demonstrate that the changes made to the second implementation of the design process—the characterization of the project as "writing the collection experience" as a "form of dialogue between author and audience," the use of a structured critique of an existing rhetorical collection to explore these ideas before beginning design, and an elongated, varied phase of critique for the in-progress designs—resulted in clearly identifiable changes to the ways that designers perceive their roles and their process, and increased the thematic consistency and creativity of the designs themselves. Additionally, these findings enable reflection upon the notion of authorship as a productive way to approach the design of resource collections, and upon the role of criticism in understanding, developing, and researching information artifacts.



A National Geographic video podcast examines the practices of brujos in Catemaco, Veracruz, Mexico.

Healing Acts: Witchcraft

Explanations: Brujeria

Cause of Ailment: Evil Eye

Ailment: Lovesickness

Perspectives: Mondo

Figure 6: Video metadata forms a narrative

Collection designers as authors of dialogic experience

All information systems enact an interpretive frame upon their contents, shaping users' perceptions of the included resources. As classification research has conclusively shown, it is impossible for information objects in a collection to "speak for themselves" in a neutral, objective way, without some level of judgment applied by the collection designer [32, 6]. While it may seem tempting to "aim for" a neutral collection, such an approach fails to grasp the inevitable human decision making that permeates all information collections. Moreover, this willful blindness can be seen as an abdication of moral responsibility; pretending to an impossible objectivity is a deceptive act.

It may seem equally tempting to design a collection based on what one thinks the audience expects or wants. Paradoxically, perhaps, this approach can also be seen as a type of ethical failure, because it refuses to acknowledge the ultimate power of the audience as critical agents able to agree or to disagree. This approach can also be limiting rhetorically; the audience will never reach a new understanding if an opportunity to explore and assess the author's perspective is not offered.

In contrast, the dialogic approach advocated in this study emphasizes the value of active engagement between an author's ideas and audience beliefs, goals, and values. While it is more common to imagine that "rhetoric" entails any means necessary, including manipulation and deceit, to coerce an audience, this is not the case, although as Aristotle observed, rhetoric comprises a set of tools that can be used for good or ill [1]. I would suggest that the rhetorical process foregrounds audience action as stemming from deliberate choice informed by the flow of ideas. Inspired by feminist epistemology, Foss and Griffin characterize such a rhetoric as "invitational" [24]. The student designers found this notion of invitational rhetoric to resonate strongly with their goal to structure a dialogue between themselves as authors and their user audience.

Such ideas align well with several transformative critical practices that have found currency within interaction design. There is a clear connection with the goals articulated in Scandinavian participatory design, for example, and Ehn and Kyng's well-known manifesto to design with users, not for or by them [18]. There is also a close link with feminist notions of situatedness and located accountability [26, 37]. Both these approaches acknowledge that designers—authors—have their own perspectives, expertise, and goals, and that a designer's motivations are problematic when they are hidden or denied, not because they exist. A designer (author) who truly respects an audience will be inspired by differences in perspective, and thus will be able to use conflicts in beliefs, values, and goals productively, in the manner of equal partners in a conversation, where the outcome is uncertain and is therefore potentially exciting, revelatory. The resource collections created in the context of this study, with their provocative category structures and other thematically compelling features, provide evidence for this assertion. As the student designers came to understand, in such an environment of equality, the audience cannot be patronized. The author must work to understand the audience's convictions but not reproduce them; instead, the author uses these as a foundation for new understanding on everyone's part, the author included.

The idea of a rhetorical dialogue, and the roles of author and audience, instead of user and designer, can be of value in various forms of interaction design. "Audience-centered" design may help to rehabilitate the concept of the user as an active, vital agent whose beliefs and values are to be understood and respected, in order that the story be heard and dialogue ensue. Too often, in system design, the "user" is decomposed into a faceless set of tasks and needs, whose success at getting things done is prioritized over thoughts and feelings [16]. As this study suggests, however, an audience must be understood at a much deeper level if the author is to succeed at initiating a true conversation.

Criticism in design education and practice

This dialogic rhetorical approach to collection design was partly enabled through the student designers' experiences with the structured, formalized critique of an existing collection. Students were required to produce a written critical analysis that considered the example collection from the perspective of the author, from the perspective of the audience, and from the perspective of an information critic surveying the negotiated relationship between the two. Moreover, they were required to present their ideas through a standard essay format, with a clear unifying thesis, and to bolster their observations with reference to course readings from rhetoric, literary studies, design, and information criticism [15, 23, 31, 4].

The work performed in the critique markedly reinforced the notions of dialogic design that the project was attempting to instill in the participants and directly informed the resulting collection designs. One form of inspiration involved the recognition of relatively deep thematic problems in the example, Sustainability Is Easy, and an accompanying resolve to avoid such issues in their own designs. But another form of inspiration was generated from sustained engagement with the work of scholars and critics of design, rhetoric, and so on, and from the application of these ideas to the example collection. Isabella, for example, employed Lowgren and Stolterman's notion of "use qualities," and in particular their characterizations of seductivity and control/autonomy, to provide depth and structure to her critique, and then also used those concepts to propel her own project.

The results of this study provide clear empirical evidence that critical inquiry of the form endorsed by Bardzell, Bolter, and Lowgren can be an important and productive component of interaction design education [5]. The student designers read scholarly work that took a critical perspective; they used their understanding of this work to create their own critical accounts of a design example; and they were then able to extend that thinking to produce their own innovative collection designs, even though they had never engaged in this sort of design activity before. It may be argued that experienced designers do not need to articulate formal criticism in this way, that they can express sophisticated design judgments through activities such as sketches and "crit" sessions without employing a structured analysis of the sort described here. I do not think, however, that the utility of those activities is denied by exploring the complementary potential of criticism in a practice, as well as an educational, setting. Assuming a critical gaze forces one to look at a design differently, to develop a new vocabulary for describing how things work and what effects are produced. The form of attention produced through critical engagement with existing artifacts can, this study suggests, be a direct engine of creativity and innovation.

ACKNOWLEDGMENTS

My sincere thanks to Gary Geisler and the students in INF 385U, Digital Media Collections, spring 2010 and 2011, for making this work possible. I also thank Pedja Klasnja and Chris LeDantec for their helpful notes on earlier drafts.

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