

PROCESS-ORIENTED DESIGN: CONVERSATIONAL INTERFACES FOR GLOBAL ACCESSIBILITY

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The ability of the Internet to serve as a bridge to cultural understanding relies in great part on issues related to accessibility. My focus in this article is on accessibility as it relates to providing individuals with the full capabilities of the Internet to facilitate a process of association and learning, which can alleviate many issues that arise with regard to intellectual access to Internet-related technologies. I propose that by designing for a process of personal exploration that truly taps into the ability of the Internet to store, send and receive information, a more experiential Internet system could emerge that would provide students and teachers with a powerful venue for learning about different cultures, while more fully meeting the goals of global accessibility.

I discuss the importance of obtaining a cultural education, and hold up experiential learning models as evidence to support the value in our intellectual development of studying culture. I propose that the traits of active conversation, which allow ideas to be promoted, exchanged, and refined over time, can be used as a model for evaluating existing methods employed on the Internet. The model can also serve to develop and to evaluate new solutions. This study will also consider the variety of media tools available on the Internet as conduits of access and will explore how each of these, as “culture carriers,” can empower the Internet to move beyond a static sender–receiver model of communication, to truly emulate signals of response and the relationship of ideas characteristic of an active, dynamic conversation.

The Inaccessible Internet

The vision of the Internet is one of accessibility and freedom; of a “commons,” a space that has no age restrictions, and no international, racial, economic or social boundaries, where the rights to use it are held equally by all. Yet, there exists a narrow cultural representation on the Internet that results from a lack of universal access to Internet technologies in developing nations. This privileged access reflects the preferences and expectations of users in developed nations and hinders the potential of the Internet to encourage diversity and increase global understanding. Developing nations are, in effect, captive audiences rather than full participants in the voice and influence of the Internet. Outside of email, blogs, and online chat rooms, within the primarily text-based social areas of the Internet there is limited content shared by developing nations themselves. However, we are also captives to what our own society and those similarly privileged have to offer, gaining meaning and interpretation of other cultures from information created largely by individuals in our own culture. Clearly, the lack of technical accessibility in developing nations not only affects their society, but our own as well.

The lack of a global presence on the Internet, however, goes beyond issues of technical access, either physical or intellectual. It is rooted in the very methods of access which result from current standards of hyperlinking the information available on the Internet. Hyperlinking is the basis of interactive media and is accomplished through a process of association, a central component of human thought. Association relies on an individual drawing on past experiences and of relating concepts to reflect on new ideas and solve problems. Historically, we would look at an image or read certain text and draw our conclusions, relating new information with other information we have gathered and compared. We would continue this process, forming new hypotheses and conclusions until we achieved

understanding.

Hyperlinking, however, provides an alternative to this process where we instead click on a link (i.e., a sentence, a word, or an image) and follow this idea to a related concept already laid out for us. So instead of making our own mental associations, interactive media demands that we follow someone else's. This becomes a one-sided conversation that provides limited means to reflect and build understanding through the drawing of our own conclusions, and offers no opportunity to respond to the assertions made by others—one of the basic elements in effective communication. The natural process we apply to achieve understanding and to solve problems, to relate concepts through analogy, affirmation or past experience is in fact quite limited on the Internet. What is needed is a new approach to the design of interactive media, where access to information moves beyond the one-way mode of communication, and instead responds to a user's input in order to provide information in a more meaningful way; a way that empowers the user to not only receive information, but to contribute as well.

Cultural Understanding

Studying culture is an experience we have every day as we engage with our fellow citizens, whether at school with teachers and students, at home with our families, or at work with our colleagues. We learn and develop social etiquette and therefore respond "appropriately" when called upon to do so. Cultural expert Geert Hofstede calls these responses "mental programs" that result from a shared system of meanings he calls culture.¹ Immanuel Kant first referred to these knowledge structures as schemata, a term cognitive psychologists continue to use today to describe the process of codifying our experiences. Each decision we make is shaped by a history of experiences involving similar decisions we have likely already faced. "Culture provides people with a meaningful context in which to meet, to think about themselves and face the outer world."² Thus culture, identity, and the quest for knowledge are inescapably intertwined.

Our natural ability to navigate within our own culture, however, does not necessarily apply to other cultures. Every culture has unique differences that distinguish it from every other culture. It is perhaps easier to comprehend the importance of understanding how differences in culture influence our lives by using the methods of Fons Trompenaars, a leading expert on managing cultural differences. Trompenaars defines culture as the way in which a group of people solve problems and reconcile dilemmas.³ He believes that studying how a group of people solve problems allows us to distinguish a culture's uniqueness. For example, one culture may tend to resolve problems with a universal answer, relying heavily on rules and precedence, while another may be more flexible in its solution, taking into account the individual circumstances of the situation. Similarly, status may be accorded in one culture based on a person's achievements in school or at work, or status may instead be based on birth or kinship or by association with others.⁴ There are many other criteria used to analyze culture, however with this basic understanding of how differences in culture affect our approach to solving problems, we can begin to appreciate how important understanding these differences is to constructive interaction with cultures other than our own.

Sen. William Fulbright once observed that unless learners obtain not only the knowledge, but also the experience and skills required to interact constructively with people from cultures and countries other than their own, the world's future will be bleak. Many university students seem to acknowledge this growing importance in their education. According to the Institute for International Education in New York, the numbers of American youths making an overseas experience part of their academic year has more than doubled over the last decade.⁵

The Experiential Model

Experiential educator Richard Kraft believes that cross-cultural programs are perhaps our most powerful experiential learning environments.⁶ Experiential learning environments essentially encourage learning through direct experience, where the learner is personally involved in the decision-making

process and thereby develops a sense of responsibility to help carry it through. There are many models of experiential learning, but the general theme of most models involves the learner being placed in a demanding, authentic environment that requires a mastery of new skills, followed by an action requiring the application of these new skills. Following skill mastery and action comes analysis and reflection of their application, ultimately forcing the learner to reorganize the meaning and direction of life experiences.⁷ Consider this last step, that of reorganizing the meaning and direction of the learner's life experiences. If our experiences provide us with a meaningful context in which to relate to our environment, and these same experiences provide us with no such context when we find ourselves in a new and unique culture, wouldn't we then be forced to reorganize the meaning and direction of our past life experiences as we adapt to this new environment?

Anthropologist Kalvero Oberg invented the term "culture-shock" to describe the "anxiety that results from the loss of all our familiar signs and symbols of social intercourse" experienced when we enter a new cultural environment.⁸ In other words, we experience "culture-shock" when we don't have the codified experiences or schemata needed to process our surroundings. According to Psychologist P.S. Adler, culture-shock is in fact "a transitional experience" important for the process of self-development and personal growth.⁹

While the best way for students to understand the relevance of differences in culture is to travel abroad to countries that are uniquely different from their own and experience the culture first-hand, this isn't always feasible. Yet, according to the Massachusetts Institute of Technology Comparative Media Studies Lab, "teaching culture in the classroom (in the sense of behaviors, attitudes and values) is a very difficult task, since culture is a very elusive, often abstract, implicit and essentially invisible notion."¹⁰ The challenge, then, is to give students the tools to experience the rules of life in another culture through other methods.

Designing for a Process of Learning

Many look to the computer as the conduit through which we might learn about culture. The computer, in particular the Internet's use of it, allows us to translate and even redefine the unique aspects of our own culture on a global scale. According to new media theorist and University of California professor, Lev Manovich, the Internet is the single most "material and visible sign of globalization."¹¹ As such, it is perhaps the best tool at our disposal to share, experience, and appreciate differences in culture.

Manovich believes that through computerization has come a "rapid transformation of culture into e-culture, of computers into universal culture carriers, and media into new media."¹² The Internet is the first form of media to affect multiple levels of cultural communication, including the ability to send and receive, to reinterpret and reiterate, to manipulate, to store and to distribute. It accomplishes this using all types of media, including text, still images, moving images, sound, and spatial constructions.

The interactivity of new media allows individuals to select which items to view, to select the order of their presentation, and to define their own path through the information structure. In this way, say many new media theorists, they become coauthors through the creation of a new, unique work. Yet, although users do have options of which path to take, they are still navigating through a branching structure consisting of predefined objects. "If a complete work is the sum of all possible paths through its elements," says Lev Manovich, "then the user following a particular path accesses only a part of this whole. In other words, the user is activating only a part of the total work that already exists."¹³ Where Manovich sees selection as a new form of control enabled by interactivity, the idea of compositing takes selection a step further. Compositing allows individuals to select discrete media objects and combine them into an altogether new media object; and thereby truly begin to author their own online experiences.

Carnegie Mellon professor and interactive media designer Suguru Ishizaki believes that the design of online media should function as a dynamic contributor towards an unforeseen solution. It shouldn't predict the path an individual would pursue, but strive to be open-ended. In this way it allows users to

control the direction of their learning and truly author their own experiences. Historically, this has not been the standard approach for designers of interactive media. “In design, we seek confirmation of our success through the artifacts we create, rather than in the processes that lead to their creation.”¹⁴ According to Dutch designer Max Bruinsma, process-oriented design means that the artifact we “design, be it concrete, or visual, behavioral or manipulable, is a function, not of the process involved in its production (as it was traditionally) but as a function of the process it wants to facilitate as a catalyst.”¹⁵ Process-oriented design assumes that to be useful, an interactive system’s goal is not to impart information in a single way, but that by responding to the user, it can provide that information in a more meaningful way. When designers plan for a process of learning, the parameters of predictability are expanded and critical analysis and reflection is encouraged through enabling users to evaluate their own process of contextually linking their ideas within the information—a critical component of intellectual growth.

According to psychologist Lev Vygotsky and his studies on intelligence, the ability of an individual to make these links is, in itself, a natural process of private thought. Vygotsky believed one’s personal interaction within society could be broken down into four interrelated systems, beginning with the personal system of our immediate home environment, and extending to the society and culture in which we live.¹⁶ He posited that social interaction within these systems directly affects our cognitive ability. In cultural education, then, the collaborative aspect is derived from the obvious benefits that result when individuals from different cultures can explore information together, and gain meaning from alternate perspectives on the same content. The personal dimension derives from the way that each member processes, evaluates, and creates his or her own contextual links, something that is highly dependent on the personal interests and experiences of the individual.

The Conversation Model

“The link is the first significant new form of punctuation to emerge in centuries, but is only a hint of things to come. Hypertext, in fact, suggests a whole new grammar of possibilities, a new way of writing and telling stories. But to make that new frontier accessible, we need more than one type of link.”¹⁷ At present, the process of hyperlinking is based on a structure of paths already established—we follow a link to a new set of elements in a process that defines someone else’s mental associations shared when the link was created. In this way the process of hyperlinking is much like a one-sided conversation. We are able to receive what someone else is relating to us, but we are unable to respond, unable to contribute to the conversation. What is needed is a way for individuals to make their own unique links among found information, and to relate new information in context with existing information. By tapping into the ability of the Internet to both send and receive information, we can begin to simulate an active, responsive, and dynamic conversation.

Conversation can be defined as any process, within or between people, that is ongoing and causes ideas to be promoted, exchanged, and refined over time. Conversation takes place within an active environment of cultural dimension; we rely on our own experiences within a culture to communicate successfully, drawing on elements of culture to express our ideas and to understand those of another. On the Internet the elements of culture are transmitted through media tools such as text, audio, image, and video—in essence becoming the code for the natural language of a culture. These are the tools used to transport both the initial message received, as well as the responses that promote the ongoing exchange characteristic of conversations.

This continuous exchange occurs as a result of shared information and associations made by users, as well as by the interface in response to their choices or input. Individuals respond by making choices through the act of clicking a link or by making associations among other information. Associations include new information provided by users that they relate to the information at hand, or information they choose to relate from their own saved history of information. The interface responds to their input with a selection of related information previously supplied by other individuals and available through a variety of media tools. Viewing options are presented in more than one way, using, for example,

hierarchy, relevance, category, and personal history. In essence, responding to the user with, “Do you mean like this?” or “This is related,” or “Someone else saw it this way.” It doesn’t assume what the user was thinking, but leaves the path open-ended.

By expanding the concept of hyperlinking to include a continuous process of information exchange found in active, responsive conversation, we open up new potential for the Internet to achieve its vision of global accessibility. However, this is only the beginning. The computer has the potential to take this process a step beyond traditional modes of conversation through its ability to *store* information. Imagine engaging in a lengthy and complex conversation that covered many unique concepts and diverged down several disparate paths. By the end of the conversation, you might only remember a few of the ideas exchanged throughout the discussion. But if there were a way to store the ideas communicated during this discussion, you might be able to draw on them later on to relate to new ideas shared in the conversation. In other words, this could be used as a tool to create contextual links among the ideas and to confirm or refine understanding. Storing ideas and associations that individuals make along their initial path through the information enables users to more easily reflect and build on their experiences, a critical step in learning.

Conclusion

Differences in culture are what enables the world to prosper, both economically and creatively, as it encourages diversity in problem solving and affects not only the ways we work together, but also our inventions. According to the United Nations Educational, Scientific and Cultural Organization’s General Conference on Cultural Diversity, as “a source of exchange, innovation and creativity, cultural diversity is as necessary for humankind as biodiversity is for nature. In this sense, it is the common heritage of humanity and should be recognized and affirmed for the benefit of present and future generations.”¹⁸ Understanding cultural differences can often play an important role in successful conflict resolution and human security, yet without direct exposure to a culture unique from one’s own, learning and teaching about culture remains challenging. The Internet is perhaps the best solution to this challenge.

Learning about differences in culture through the Internet, however, must begin with a new approach to the design of Internet-based applications and Web sites. Systems must be designed so that the interface is open-ended, thereby allowing individuals from different cultures to explore and share their experiences in their own way, based on their own cultural heritage. Such interfaces would allow users to gain insight from an alternate perspective, through viewing the same information in different ways, and would encourage and enable individuals from developing nations (i.e., the subject-matter experts on their own culture) to share information through a user-friendly medium, without technical expertise.

Media tools such as text, sound, still images, and video—the culture-carriers of the Internet—allow us to emulate elements of active, responsive two-way conversation, which in turn permits individuals to define and author their own learning experiences. The diversity of media tools mimics the flexibility of active conversation as it allows us to compare and relate information between and within cultures in a dynamic media setting that can adjust to reach multiple learner types. By designing the system to enable individuals to create and add their own links of new information, we enable users to reflect and build on their experiences over time, and substantially augment the abilities of traditional conversation.

By tapping into the full potential of the Internet to store, send, and receive information in a process that mimics and augments active human conversation and memory, we can bring the Internet closer to its vision of accessibility, and provide all people with the tools and path to study other cultures and gain understanding of the value of cultural diversity to our world.

NOTES

1. Fons Trompenaars, *Riding the Waves of Culture* (New York: McGraw-Hill, 1998), 13.

2. *Ibid.*, 24.

3. Ibid., 6.
4. Ibid., 8.
5. Institute of International Education, "Open Doors Online," <http://opendoors.iienetwork.org/>.
6. Richard Kraft and James Kielmeier, *Experiential Learning in Schools and Higher Education* (Dubuque, Iowa: Kendall/Hunt Publishing Company, 1995), 162.
7. Kraft, 203.
8. R.J. Corsini, *Encyclopedia of Psychology*, vol I. (New York: John Wiley & Sons, 1994), 188.
9. Stephen Bochner, Adrian F. Furnham, and Walter J. Lonner, *Culture Shock: Psychological Reaction to Unfamiliar Environments* (New York: Routledge, 1986), 23.
10. Massachusetts Institute of Technology, "Cultura," <http://web.mit.edu/french/culturaNEH/>.
11. Lev Manovich, *The Language of New Media* (Cambridge: Massachusetts Institute of Technology Press, 2001), 6.
12. Ibid., 19.
13. Ibid., 128.
14. Max Bruinsma, "North Carolina State University, Raleigh, North Carolina," *New Information Environments*, online course chat transcript.
15. Ibid.
16. Lev S. Vygotsky, *Thought and Language*, trans. and ed. Alex Kozulin (Cambridge: Massachusetts Institute of Technology Press, 1986).
17. Sherry Turkle, *Life on the Screen: Identity in the Age of the Internet* (New York: Simon and Schuster, 1995), 110.
18. United Nations Educational Scientific and Cultural Organization, "UNESCO.org," <http://www.unesco.org/>.