
Working toward “Synthetic Serendipity” in a living HCI Curriculum

Elizabeth Bonsignore

College of Information Studies
Human-Computer Interaction Lab
University of Maryland
College Park, MD, USA
ebonsign@umd.edu

Abstract

In this paper, I draw upon emerging frameworks for learning and a view of community practice as potential core constructs to support a living HCI curriculum. I also touch on elements of crowd-funding sites and citizen science communities as community-based inspiration to imagine a living HCI curriculum.

Author Keywords

Human-computer interaction; education; community; user experience design; curriculum development.

ACM Classification Keywords

K.3.0. Computers in Education: General.

A Living HCI Curriculum’s Community

“...I have a theory of life...and it is straight out of gaming. There is always an angle. You, each of you, have some special talents. Find out what makes you different and better. Build on that. And once you do, you’ll be able to contribute answers to others and they’ll be willing to contribute back to you. In short, synthetic serendipity doesn’t just happen. By golly, you must create it.”

- Vernor Vinge, *Rainbows End* [22] // *Synthetic Serendipity* [21]

Copyright is held by the author/owner(s).
CHI 2014 Workshop Paper: Developing a Living HCI Curriculum to Support a Global Community.

These words are spoken by Ms. Chumlig, a character in *Rainbows End*¹, a novel by award-winning science fiction writer, Vernor Vinge. The novel is set in the year 2025, when globally distributed, intergenerational teams of students, professionals, and academics collaborate by the hundreds, thousands, even millions, to prevent pandemic diseases and terrorist attacks, or to help make political decisions and works of art. Chumlig is a teacher of “*Search and Analysis*,” which is a required high school course in Vinge’s near-future world. In this scene, she is trying to convey to her students that they must each cultivate their own talents and personal knowledge in order to participate in, and effectively contribute to the worldwide collective intelligence network. Despite the data richness of Vinge’s *everyware* world [14], where the *environment is the interface* [14], individuals must still coordinate their efforts to develop as a successful community.

So why is this (somewhat fanciful) excerpt relevant? In a very real sense, a CHI workshop that aims to develop a “living HCI curriculum” aspires to the same coordinated synthetic serendipity as Chumlig inspires in her students. To build a living curriculum, you need an active community to sustain it.

The ubiquitous, augmented interfaces in Vinge’s imaginary world are not so far removed from present day; the people and the interactive communities they engage in are closer still. Approaches to learning – both in the novel and in today’s “reality” – are similar (e.g., classrooms, labs, online, face-to-face, gaming

¹ Chumlig’s dialogue varies slightly between *Rainbows End* and the *IEEE Spectrum* article that preceded it, “Synthetic Serendipity.” [21,22] Of interest, Vinge is a retired CS professor [20].

environments), and cultural differences and nuances remain [8,22]. Thus, the inclusion of theoretical frameworks and social sciences knowledge about community formation, participation, and engagement will be a key contributor in discussions regarding the workshop question, “*Which technological infrastructures can best support a community of students, practitioners, and educators?*” [1,12,23,24]. This is a major reason why I would like to participate in the workshop: in my doctoral studies for the past few years, I have explored learning communities and been a member of them (see inset, p. 3). I have participated in research projects whose goals are to help children from 7 to 11 years old not only become familiar with, but also become experts in interaction design [6,7,9,26]. I would like to be a part of and contribute to the mobilization of a community and learning resources that may form a new wave of HCI learning, integrating common elements across the three waves that our interdisciplinary field has ridden thus far [2].

Beyond more established lines of research on the sociotechnical requirements to build thriving, self-sustaining communities, I would also like to explore how elements from crowd-funding [13], human computation [18], massive collaboration [16], and peer-to-peer learning (e.g., p2pu.org/), might be tapped to help develop the community infrastructure for a living HCI curriculum.

The need to Integrate HCI Practices

The establishment and evolution of the sociotechnical infrastructure to support a community of *professionals* [8] is one area to address when formulating plans for a living HCI curriculum; creating core disciplinary content is another [8,11]. However, a living HCI curriculum

HCI Educational Experiences

As a member of the interdisciplinary, design-based research group in the Human-Computer Interaction Lab (HCIL) over the past 5 years, I have practiced participatory design with children and adults, working on projects ranging from traditional web-design to online community development and mobile storytelling [3,7,26]. I have also led or been the co-author in papers on learning environments such as Alternate Reality Games and Life-Relevant Learning communities at both HCI and Learning Sciences conferences [4-6,9].

I also hope to apply a few experiences that I was fortunate to have in my professional career as an operations officer and research scientist, before I returned to academia as a doctoral student. I was instrumental in redesigning computer/networks training for the US Navy (1991-1993); I taught computer science courses at the US Naval Academy (1998-1999); and developed special communications courses for the US Department of Defense (1997, 2000-2007).

should include more than core content areas and concepts [11], and the sociotechnical infrastructure to support it. A need to examine and evaluate *practices* through which HCI practitioners and researchers do their work may be even more important to the development of a living HCI curriculum. After all, an individual imagines and identifies herself as a member of a community and profession through her practices [23].

Here, models and frameworks from education and the learning sciences may contribute to workshop discussions. For example, a 2014 report from the US National Research Council [17] presented a framework for science learning around three dimensions: *core ideas* in the disciplines of life sciences, physical sciences, earth/space sciences, engineering and technology; the *practices* of scientists and engineers; and key *crosscutting concepts* that link the science disciplines. For instance, a life sciences lesson on structures and functions of animal organisms would constitute a core idea. The practices supporting the exploration of these ideas would entail: asking questions, planning investigations, collecting and analyzing data, and formulating explanations. Crosscutting concepts for this example could include patterns and system models [17]. Such a framework might prove a useful overlay for the broad swath of content and concepts culled from [8]'s survey of the HCI community.

Similarly, new models of HCI-oriented learning underscore the need for educational goals and curricula to support life-relevant connections, such as designing a digital desktop for high school students [25], or social media tools to support a nonprofit community

organization [15], or scientific inquiry practices through cooking [9]. The practices of citizen science community members, who balance their own personal learning and altruistic goals with larger, professional scientific community goals, may also inform workshop discussions on learning content curation and prioritization [19]. Each student in Chumlig's fictional class learns to hone her own individual skills and marshal her and her classmates' assets to benefit the worldwide collective. Similarly, a living HCI curriculum can be crafted from this workshop to promote both individual learning aims and core community values.

References

- [1] Barab, S. A., Kling, R., & Gray, J. H. (Eds.). (2004). *Designing for virtual communities in the service of learning*. New York: Cambridge University Press.
- [2] Bødker, S. (2006). When second wave HCI meets third wave challenges. *Proc. NordiCHI '06*. ACM Press, New York.
- [3] Bonsignore, E., Hansen, D., Galyardt, A., Aleahmad, T., & Hargadon, S. (2011). The Power of Social Networking for Professional Development. In T. C. Gray & H. Silver-Pacuilla (Eds.), *Breakthrough teaching and learning*. New York: Springer.
- [4] Bonsignore, E., Kraus, K., Visconti, A., Hansen, D., Fraistat, A., & Druin, A. (2012). Game design for promoting counterfactual thinking. In *Proc. CHI 2012*, ACM Press, 2079–2082.
- [5] Bonsignore, E., Hansen, D., Kraus, K., Ahn, J., Visconti, A., Fraistat, A., & Druin, A. (2012). Alternate Reality Games: Platforms for Collaborative Learning. In *Proc. ICLS 2012*, Internat'l Society of the Learning Sciences, 251–258.
- [6] Bonsignore, E., Ahn, J., Clegg, T., Guha, M. L., Yip, J., & Druin, A. (2013). Embedding Participatory Design into Designs for Learning: An Untapped

- Interdisciplinary Resource? In *Proc. CSCL 2013*, Internat'l Society of the Learning Sciences, 549–556.
- [7] Bonsignore, E., Quinn, A. J., Druin, A., & Bederson, B. B. (2013). Sharing Stories “in the Wild”: A Mobile Storytelling Case Study Using StoryKit. *ACM Trans. on CHI*, 20(3), 1–38.
- [8] Churchill, E. F., Bowser, A., & Preece, J. (2013). Teaching and learning human-computer interaction: past, present, and future. *Interactions*, 20(2), 44–53.
- [9] Clegg, T., Bonsignore, E., Yip, J., Gelderblom, H., Kuhn, A., Valenstein, T., ... Druin, A. (2012). Technology for promoting scientific practice and personal meaning in life-relevant learning. In *Proc. IDC 2012*, ACM Press, 152–161.
- [10] Hansen, D., Bonsignore, E., Ruppel, M., Visconti, A., & Kraus, K. (2013). Designing reusable alternate reality games. In *Proc. CHI 2013*, ACM, 1529–1538.
- [11] Hewett, T. T., Baecker, R., Card, S., Carey, T., Gasen, J., Mantei, M., Perlman, G., Strong, G., & Verplank, W. (1996). ACM SIGCHI curricula for Human-Computer Interaction (Web version.). New York: ACM. <http://old.sigchi.org/cdg/index.html>.
- [12] Kraut, R. E., & Resnick, P. (2011). *Building successful online communities: evidence-based social design*. Cambridge, MA: MIT Press.
- [13] Kuo, P.-Y., & Gerber, E. (2012). Design principles: crowdfunding as a creativity support tool. In *Proc CHI 2012 Extended Abstracts*, ACM, 1601–1606.
- [14] Lamantia, J. (2009, March 9). A Near-Term Vision for Evereware: Synthetic Serendipity. *UXmatters*. <http://www.uxmatters.com/mt/archives/2009/03/a-near-term-vision-for-evereware-synthetic-serendipity.php>.
- [15] Lampe, C., Resnick, P., Forte, A., Yardi, S., Rotman, D., Marshall, T., & Lutters, W. (2010). Educational Priorities for Technology-Mediated Social Participation. *Computer*, 43(11), 60–67.
- [16] McGonigal, J. (2008). Why I Love Bees: A Case Study in Collective Intelligence Gaming. In K. Salen (Ed.), *The Ecology of Games: Connecting Youth, Games, and Learning* (pp. 199–227). Cambridge, MA: MIT Press.
- [17] National Research Council. (2014). *Developing Assessments for the Next Generation Science Standards*. Washington, DC: The National Academies Press.
- [18] Quinn, A. J., & Bederson, B. B. (2011). Human computation: a survey and taxonomy of a growing field. In *Proc CHI 2011*, ACM, 1403–1412.
- [19] Rotman, D., Procita, K., Hansen, D., Sims Parr, C., & Preece, J. (2012). Supporting content curation communities: The case of the Encyclopedia of Life. *JASIS&T*, 63(6), 1092–1107.
- [20] Vernor Vinge. (2014). In *Wikipedia*. http://en.wikipedia.org/wiki/Vernor_Vinge.
- [21] Vinge, V. (2004). Synthetic serendipity. *Spectrum, IEEE*, 41(7), 35–44.
- [22] Vinge, V. (2006). *Rainbows end*. New York: Tor.
- [23] Wenger, E. (1998). *Communities of practice: learning, meaning, and identity*. New York: Cambridge University Press.
- [24] Wenger, E., White, N., & Smith, J. D. (2009). *Digital habitats: stewarding technology for communities* (1st ed.). Portland, OR: CPsquare.
- [25] Yardi, S., Krolikowski, P., Marshall, T., & Bruckman, A. (2008). An HCI Approach to Computing in the Real World. *J. Educ. Resour. Comput.*, 8(3), 1–20.
- [26] Yip, J. C., Foss, E., Bonsignore, E., Guha, M. L., Norooz, L., Rhodes, E., ... Druin, A. (2013). Children initiating and leading cooperative inquiry sessions. In *Proc. IDC 2013*, ACM, 293–296.