Pathways and Journeys Interviews with Computing Educators Spanning Continents, Generations and Gender

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Abstract

The Computer Educators Oral History Project (CEHOP), or as we have come to pronounce it, SEE 'OPE, originally was conceived to preserve a unique corner of history, although its focus has shifted to the pathways that people have followed or forged in the process of their careers.

CEOHP may be viewed in several ways. It is an *archive that captures the education slice of computing history*; it is an *associated collection of materials* useful in supporting, recruiting, and retaining under-represented groups; and it is a *searchable repository of artifacts* from computing educators, including digital audio interviews, limited video interviews, interview transcripts, photographs, vitas, and other relevant items.

The current public portion of the project may be accessed through our website ceohp.org.

1   Background

The realization that many groups, especially women, were underrepresented in what we in the US call computer science (and others label informatics, or more loosely, IT) burst forth in the US in the late 90's. Works with catchy titles such as Tracy Camp's paper, The Incredible Shrinking Pipeline (Camp, 1997) and Unlocking the Clubhouse, the Carnegie Mellon Study by Margolis and Fisher in 2001 (Margolis & Fisher (2001), delineated the differences in the educational experiences of women considering majoring in computing, and put considerable attention on the gender issue.

A keynote address in 2003 at the 34th SIGCSE Technical Symposium on Computer Science Education in Reno, Nevada, by Eric Roberts of Stanford University, outlining the need for diversity in computing, coupled with a luncheon talk by Margolis and Fisher at the same conference, planted the seed for this endeavor.

Many hallway conversations at the 2003 SIGCSE conference emphasized the need for capturing the stories of women who have persevered. We (my colleague Vicki Almstrum from the University of Texas at Austin and I) proposed a project for the SIGCSE sponsored Integrating Technology into Computer Science Education Conference (ITiCSE) held in Lisbon Portugal in June 2005. The nine participants in this working group produced a report describing what constitutes a good oral history. This report Almstrum et al (2005) delineates a set of probing questions applicable for computing educators to elicit influences such as parents, siblings, teachers, types of education and career choices, so all interviews could follow the same basic format.

2   NSF Funded Planning Process

In January of 2007 we received a $40,000 grant from the [US] National Science Foundation to move forward on the project's planning phase. The principal leadership consisted of me, Vicki Almstrum and Lecia Barker, a social scientist from the National Center for Women in Technology NCWIT in Boulder, Colorado. Soon we were joined by Anne Applin, a computer science educator from Ithaca College in New York State who was one of those whose hallway conversation at the 2003 SIGCSE conference sparked this project.

This planning process includes the building of an advisory board that will include prominent computer scientists, computer historians, oral

history academicians and web designers. We will also engage focus groups to critique our artefacts.

We early on utilized students in a capstone software engineering course to draw up many requirements for the project. Many of the considerations they emphasized remain paramount in our planning: accessibility, evaluation metrics, data security and integrity, considerations for a permanent site for the collection and ideas for long-term funding of the project

3   Building a Balanced Collection

Our first objective was to collect and analyze these stories from women at or nearing the end of their careers. Our efforts still concentrate heavily on late career faculty; but we are very intentional about collecting interviews at all stages.

Effective mentors and role models may more likely be persons who are slightly ahead of where a person is. So we began looking at senior faculty as models for new faculty, new faculty as models for graduate students, etc. We refer to this as a tiered approach to mentoring relationships to inspire the next generation down. It is a strategic aid in deciding who to add to the collection. By providing interviews and associated work products across career levels, CEOHP can provide the basis for inspiration and support across the entire pipeline.

We saw that in order to understand women's stories, we also need to collect stories from men as well. Additionally CEOHP strives for balance across a variety of additional factors to better reveal commonalities and differences such as race, ethnicity, institutional focus (small college, research university, etc.) and academic title.

4   Collecting   and   Preparing Interviews

Volunteer interviewers have been trained at several venues; for example, at workshops, at conferences, and individual just-in-time training sessions. Prior to each interview, the interviewers gather background information on the person to be interviewed. Each interview is from 1-2 hours in length, and loosely follows the outline prescribed in the 2005 Working Group report.

Digital sound is recorded through the use of handheld Olympus Digital recorders. At the project's inception, we had considered using Dragon transcription software but we discovered and the software vendor concurred that it was ill-suited for our purposes. We instead either transcribe the interviews ourselves or send them out to professional transcribers. We have recently begun to add one-minute video snippets to our interview base.

At this time, we have used the free audio processing software, Audacity to edit the interviews to eliminate irrelevant background noises and to improve wording or omit material as requested by interviewee. We have left the video segments largely unedited.

The post-interview editing is driven by largely by the interviewee. Our approach is to provide the recording plus a "substantially verbatim" transcript. We then extract "pull quotes" to highlight especially interesting passages and messages. We also gather supplemental materials for full "story". The interview is not made public until the interviewee agrees that it should be made public. In some incidences the interviewee has withdrawn either all or substantial portions of the interview; but in every cases CEOHP has maintained the original interviews in their entirety.

5   Processing
The approach to qualitative data analysis includes an iterative process of identifying persistent themes within each interview and of combining themes to identify overarching themes to connect interviews. The plan is to find codes on the first pass and to discover subcodes on subsequent passes. Counting frequencies will aid in the understanding of influences and tendencies.

The themes guiding organization of resulting materials are both the questions that: frame what we are trying to find out and the themes that emerge from the interviews themselves. Each interview has been coded with the probing questions that were developed in 2005 in so far as possible, prior to the working group convening.

Such a process is similar to the guiding principles of the South African National Advisory Council on Innovation (NACI) project: "Changing Perceptions of Women in Science, Engineering and Technology Industry: Evaluation of Career Histories of Role Models in South Africa."

6   Project Status and Comments

We have collected stories from five continents (six if we count one of the interviewees who was reared in Venezuela). We have engaged six interviewers and have 17 interviewees released on the website. (See appendix 1)

Progress is much slower than we would like. We are learning about many content areas far from our academic training. Oral histories are proliferating and we have joined the academic oral history and computer history communities. None of us were skilled in the manipulation of audio or video files. We had no funds for expensive equipment and transcription services. We had no web design experts on board. We all had full time job commitments and other professional and personal responsibilities.

Approval of the interviews takes much longer than we had dreamed possible. However, this project has a strong synergy and has engendered a deep commitment from a wide variety of constituents and partners including The Association of Computing Machinery's Special Interest Group in Computer Science Education(ACM/SIGCSE),   ACM-W—a project-based, invitation-only committee of the ACM, NCWIT, and the Computer Science Teacher's Association.

7   References

Almstrum, Vicki, Barker, Lecia and Owens, Barbara Boucher. (2005) "Building a Sense of History: Narratives and Pathways of Women Computing Educators." *SIGCSE Bulletin*, Volume 37, Number 4, 2005 December, pp. 173-180.

Camp, Tracy. (1997). The incredible shrinking pipeline. *Communications of the ACM*, vol. 40, no. 10, pp. 103-110, Oct. 1997. Full version on line, accessed 28 May 2008. http://www.mines.edu/fs_home/tcamp/cacm/paper.html

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Appendix 1

Profiles of Processed Interviews

Name	G	Country	Career	Category
*Winifred Asprey	F	USA	Deceased	Pioneer (Hopper protégé)
Richard Austing	M	USA	Retired	Award winner
Judith Bishop	F	South Africa	Senior	Award winner
Tracy Camp	F	USA	Mid Career	Leader
Nell Dale	F	USA	Retired	Author/award
Gordon Davies	M	UK	Retired	Innovator
Jenny Edwards	F	Australia	Late Career	Researcher/Mentor
Judith Gal-Ezer	F	Israel	Late Career	Award winner
*Susan Gerhart	F	USA	Retired	Accessibility pioneer
Wendy Hall	F	UK	Late Career	ACM President-elect
John Impagliazzo	M	USA	Late Career	Award winner
Maria Klawe	F	USA/Canada	Late Career	College President
Andrea Lawrence	F	USA	Late Career	Leader African-American
Dan McCracken	M	USA	Late Career	Award Winner
Joyce Currie Little	F	USA	Late Career	Award winner
*Graciela Perera	F	USA/Venezuela	New PhD	South American/ US
Jane Prey	F	USA	Mid Career	Industry./Asian American
*Jean Sammet	F	USA	Retired	Award winner
Beth Simon	F	USA	Early Career	Leader
Joy Teague	F	Australia	Retired	CS Early women issues
Alison Young	F	New Zealand	Mid Career	Award winner

*not approved